



AGRICULTURAL RESEARCH INSTITUTE  
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TRANSACTIONS  
OF THE  
HIGHLAND AND AGRICULTURAL  
SOCIETY OF SCOTLAND.

WITH  
AN ABSTRACT OF THE PROCEEDINGS; THE PREMIUMS OFFERED  
BY THE SOCIETY IN 1881; AND LIST OF MEMBERS.

PUBLISHED ANNUALLY.



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# TRANSACTIONS

OF

## THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

ON THE AGRICULTURE OF BUTE AND ARRAN.

By ARCHIBALD M'NEILAGE, Junior, Glasgow.

[*Premium—Twenty Sovereigns.*]

THE county of Bute, composed of seven islands dotted over the Firth of Clyde, offers peculiar attractions to men of science. Containing as it does that "epitome of the geology of the globe"—the island of Arran—it is little wonder that it should long ere now have claimed the attention of the votaries of geology and botany. The flora and natural history of Arran have often been written of, and few islands, otherwise so insignificant, have received so much attention. Bute has formed the retreat of many whose names are as household words in the world of art. Here Montague Stanley lived and died. Here Edmund Kean fled for repose from the plaudits of the metropolis, and Glasgow's merchant princes have many of them spent the evening of their days amid the salubrious airs of Rothesay, Port-Bannatyne, and Ascog. Bute has given a premier to Great Britain before now, and Arran is associated with the traditions of the stirring times of the Reformation and the Covenants. Indeed, it must be admitted that the county of Bute presents greater attractions to the man of science, the archæologist, and the historian, than it does to the agriculturist. A region dear to artists and tourists is not generally much accounted of by the practical farmer. Winding ravines, frowning precipices, and rugged mountain slopes are all very fine to look at, but are of little avail towards raising good crops. Nevertheless, the agriculture of these islands is not without a history, and such as we know it to be we will lay it before the reader.

The position occupied by Bute amongst the counties of Scotland is unique. Everyone has heard the story of the Cumbrac minister who prayed for the wellbeing of the "inhabitants of the Greater and Lesser Cumbræ, and the adjacent islands of Great Britain and Ireland." No part of the mainland is included in Buteshire, and the islands of Bute, Arran, the Greater and Lesser Cumbræ, Inchmarnock, the Holy Isle, and Pladda, form the county. The whole lies between  $55^{\circ} 32'$  and  $55^{\circ} 56'$  N. lat., and  $4^{\circ} 52'$  and  $5^{\circ} 17'$  W. long. According to the agricultural returns for 1879, the total area of the county is 143,997 acres, and the total acreage under crops, bare fallow, and grass, at the same period, was 24,986 acres, being 72 acres less than in 1878.

Few parts of Scotland, considering its size, offer such a variety of landscape scenery as this county. Viewed from the north one sees in front the island of Bute lying long and flat along the waters of the firth, while in rear of it there rises with overshadowing vastness the rugged peaks of Goatfell in Arran. The remarks in this paper made on Bute must be considered as applicable to Inchmarnock and the Greater Cumbræ, and those made on Arran will apply to the Holy Isle and Pladda. The Lesser Cumbræ contains 700 acres; it is owned by the Earl of Eglinton, and, although included in the county of Bute for parliamentary purposes, it forms part of the parish of West Kilbride in Ayrshire. Its geological formation is Secondary trap, which seems to rest on a substratum of brown sandstone. The cultivation is confined to a few patches growing potatoes and the ordinary garden produce. A great number of rabbits are reared on the island; but, in fact, the Lesser Cumbræ with the other two small islands—Pladda and the Holy Isle—may be said to derive all their importance from the fact of lighthouses being erected on them.

As the modes of agriculture pursued in Bute and Arran differ in many particulars, and the prices of the farm produce in each are ruled by different markets, we think it better to treat of the two islands in separate sections, and to detail the progress of farming in each under distinct headings. In order, however, to give an idea of the agricultural progress of the whole county during the past twenty-five years, we here subjoin two tables of statistics compiled from reliable resources. The first table shows the acreages of the various crops in Bute and Arran in the year 1855, compared with the acreages of the same crops as sown in 1879. The second table shows the numbers of live stock kept in the islands in the former year, compared with the numbers kept in the latter year. And we have no doubt that a slight study of these tables will convince the reader that great progress in an agricultural respect has been made by the county during that interval.

BUTE AND ARRAN.

LAND UNDER CROPS.

1855.				1879.		
Crop.	Bute.	Arran.	Total.	Crop.	Bute & Arran.	Difference.
	acres.	acres.	acres.		acres.	acres.
Wheat.....	832	184	1016	Wheat.....	78	Decrease 938
Barley.....	154	17	171	Barley and Bere..	807	Increase 636
Oats.....	2680	1661	4341	Oats.....	4596	" 255
Rye.....	5	30	35	Rye.....	51	" 16
Bere.....	0	133	133	(See Barley.)		
Beans.....	11	118	129	Beans.....	115	Decrease 14
Pease.....	0	40	40	Pease.....	10	" 30
Vetches.....	25	3	28	Vetches.....	19	" 9
Turnips.....	1188	421	1609	Turnips.....	1555	" 54
Potatoes.....	625	342	967	Potatoes.....	1344	Increase 377
Mangold.....	4	10	14	Mangold....	10	Decrease 4
Carrots.....	0	4	4	Carrots.....	2	" 2
Cabbage.....	5	4	9	Cabbage and Rape	1	" 3
Turnip seed....	4	5	9	Permanent Pas- ture, exclusive of Heath, &c. ....	9743	
Bare Fallow... ..	55	105	160	Bare Fallow.....	82	" 78
Grass and Hay under rotation	6471	3002	9473	Grass & Hay, &c.. under rotation.	6573	" 2900
			18,138		24,986	Increase 6848

LIVE STOCK.

1855.				1879.	
Stock.	Bute.	Arran.	Total.	Bute and Arran.	
Horses for agricultural purposes above 3 years old.....	390	299	689	Horses used solely for agri- cultural purposes.....	790
Do. under 3 years old.	208	64	272	Horses kept solely for breeding	428
All other horses.....	38	26	64	Total Horses.....	1,218
Milk Cows.....	1,592	1,213	2,805		
Other Cattle.....	1,844	1,142	2,986	Cows and Heifers in milk and in calf.....	3,175
Calves.....	964	660	1,624	Other Cattle 2 years of age and above .....	1,644
Sheep of all ages for breeding.....	3,873	12,925	16,798	Cattle under 2 years of age	2,747
Sheep of all ages for feeding.....	2,023	3,531	5,554	Total Cattle .....	7,566
Lambs of 1855.....	3,028	9,174	12,192		
Swine.....	426	360	786	Sheep 1 year old and above	27,184
Totals.....	14,376	29,394	43,770	Do. under 1 year old .....	13,861
Total Horses... ..			1,025	Total Sheep.....	40,495
Total Cattle.....			7,415	Pigs.....	678
Total Sheep.....			34,544	Total Live Stock in 1879...	49,952
Total Pigs.....			786		
Total Live Stock in 1855.....			43,770		



• An analysis of the first of the foregoing tables will show, 1st, a marked increase in the acreage under cultivation in 1879 as compared with 1855; 2d, an extraordinary decrease in the breadth of land growing wheat, and an equally extraordinary increase in the breadth under barley; 3d, a decrease to the extent of 54 acres in the amount of land under turnips, and an increase of 377 acres growing potatoes; and 4th, the acreage under sown grasses, sanfoin, and clover, shows a decrease of 2,900 acres in 1879, but in the same column will be found an item of 9743 acres under permanent pasture, not heath or mountain land, against which there is no corresponding entry in the column for 1855. The result of this analysis, therefore, is that there is found to be, in 1879, 6848 acres under cultivation more than there was in 1855; that the growth of barley has in a great measure, though not altogether, superseded the growth of wheat, that an increased number of acres are now green cropped, and more potatoes are grown and less turnips than in 1855; and that there is a considerable increase in the acreage under permanent pasture. As we proceed with our report evidence in support of these statements will be furnished, and the causes which have produced these changes will be referred to.

Coming now to the second table, we find that the number of horses in the county has increased during the last twenty-four or twenty-five years by 188 animals, the number of cattle by 151, the number of sheep by 5951, while the number of pigs has decreased by 108. The total increase in live stock over the period, therefore, is 6182 animals.

The only other statistical information, indicative of the progress the county has made, agriculturally and otherwise, during the period reported on, to which we will refer, is furnished by a comparison of the rental of the county at intervals since 1855. In that year, *inclusive* of the burgh of Rothesay, and the extensive watering-place of Millport in Cumbræ, the entire valuation of the county amounted to £53,567; in 1865, *exclusive* of Rothesay and Millport, the valuation was £34,679; in 1870 it was £41,054; in 1875, £43,725; and in 1880 it is £47,938. The rental of the island of Bute, *exclusive* of the burgh, in 1880, is £25,109, 9s.; the valuation of Arran, £20,136 10s.; and of Cumbræ, £15,690, 18s.

#### BUTE.

The island of Bute, which gives the name to the county, although not its most extensive division, is nevertheless the richest in resources, and, taken as a whole, the most advanced in agriculture. Its centre is in 55° 50' N. lat. and 5° 4' W. long. It lies 40 miles west from Glasgow, and 18 miles south-west of Greenock. Its greatest length is about 14½ miles, its average

breadth is about 3 miles, and its circumference about 35 miles. Including Inchmarnock, which lies west of it about a mile and a half, its total area is 31,836·475 acres. Its highest summit is Kames Hill, which is 875 feet above sea-level; and there are in it three lochs of some extent, viz., Loch Fad,  $2\frac{1}{2}$  miles long by  $\frac{1}{2}$  mile broad, Loch Ascog, and Quien Loch.

Naturally and geologically the island is divided into four distinct sections. The Garrochhead, forming the extreme south, is composed of steep rugged hills; trap rock protrudes itself on every hand, and imparts to the scene, as viewed from the water, a very fierce aspect. Proceeding north, the second division, lying between Rothesay Bay and Kilchattan Bay on the one hand and Scalpsie Bay on the other, is composed with slight exceptions of red sandstone. The third division, extending from Scalpsie Bay to Ettrick Bay, consists of chlorite slate; and the fourth division, from Ettrick Bay to the Kyles of Bute, is composed almost entirely of micaceous schist. The mineral deposits of the island are lime, coal, and slate, but all are of an inferior quality.

The following description of the island, as one views it from the steamer's deck when sailing round it, will give a general idea of its fertility, and the measure of its agricultural enterprise. Sailing from Rothesay northwards through the Kyles, before us lie patches of cultivated soil beautifully laid out and lying well to the sun, and alternating with these, little bits of moorland covered with heather and whins. The land ascends gently almost from the water's edge, and the further west one sails through the narrow strait between the island and Argyllshire, the little cultivated plots on it become fewer and fewer, till, at the point of the island facing Loch Ridden, it presents one mass of almost barren rocks, on which grow a few patches of scraggy wood. Indeed, the extreme north end of Bute may be said to be almost uncultivated and unprofitable for cultivation.

Turning round the Buttock Point, the agriculturist soon finds as he skirts the west side, that here farming is prosecuted with energy, and that a somewhat cold and unkindly soil is made to yield crops of fair average quality. In Ettrick Bay and Scalpsie Bay, and up the straths which intersect the island from Ettrick Bay to Kames Bay, and from Scalpsie Bay to Rothesay Bay, the soil is much more kindly, and in the valleys patches of fertile loam relieve the monotony of sharp sandy till which prevails throughout the island.

The south end, with the exception of the extreme south, is well under cultivation, and Inchmarnock grows splendid barley crops. Rounding the Garroch Head, Kilchattan Bay bursts upon the view, with the beautifully wooded slopes of Mountstuart and Kingarth. In the bay, and on the slopes and over the brows of the hills, the soil, which is of a sharp gravelly nature,

raises splendid potatoes for the early markets. This eastern side of the island is much more wooded than the western, and altogether presents a more pleasing appearance.

The principal proprietor in Bute is The Most Noble the Marquis of Bute, K.T. Mr Thomas Russell owns the estate of Ascog; a portion of the island belongs to the burgh of Rothesay, and there are also one or two other smaller proprietors. There are few parts of Scotland in which the relationships of landlord and tenant are so creditable and pleasant. Since the noble family of Stuart obtained possession of the island in 1318, Bute has ever been a favourite residence of the representatives of the house.

It was stated by the present bearer of the title, when fourteen years of age, that his desire was that all his tenants should sit easy, and in every instance when it has been necessary for his desires to be consulted, the same spirit of anxious solicitude for the good of his tenantry has shown itself. The widows of farmers who have proved themselves unequal to the task of managing their husband's businesses have been invariably pensioned, and it has been a rule of the estate for many years that on expiry of leases no farms should be advertised unless the tenant wishes to quit. All draining for the last eighteen years has been executed at the landlord's expense, the tenant paying 5 per cent. on his outlay. The steadings on the island are commodious and in excellent repair, in which state they are maintained by the landlord. Old tenants invariably have the first offer of farms to let, and no farm is ever offered to the public unless the former tenant is retiring from the business. On formally requesting it, permission is given to all tenants to trap or snare rabbits on their holdings.

Besides treating their tenantry in this liberal manner, the landowners in Bute have done much in the way of presenting gifts to, and carrying out works of utility and interest in, the burgh of Rothesay, to make that favourite watering-place even more popular than it has been, and of course the greater the number of visitors to Rothesay the brisker the demand for dairy produce. The Marquis has renovated the old castle of Rothesay at great expense, and the munificent gifts to the burgh of the late A. B. Stewart of Ascog Hall, and of Thomas Russell of Ascog, should not be forgotten by those who derive considerable benefit from the great influx of Glasgow visitors during summer.

In addition to many other premiums a grant of £20 is annually made to the funds of the Farmers' Society out of the exchequer of the Bute estate office, and for several years, through the instrumentality of the late Mr Henry Stuart, a silver cup was competed for, which was eventually to become the property of the tenant on the Bute estate who should twice be

adjudicated to have the best managed farm. This cup was awarded in 1867 to the late Mr Alexander Hunter, Mid St Colmac; in 1868, to Mr James Duncan, Culivine; and in 1872 to Mr Robert M'Allister, Mid Ascog, who, having again been awarded it in 1875, now holds it in possession.

#### BURGH OF ROTHESAY.

As the onward progress of industry in the island of Bute is intimately connected with the wellbeing of the burgh of Rothesay, a few particulars regarding the latter may not inaptly find a place here.

Rothesay is situated on the east side of the island, and has a population of well-nigh 8000 inhabitants. A considerable amount of trade was until recently carried on in the town, and a plentiful water-supply, suitable for use as a motive power, peculiarly adapted it as a centre for carrying on the business of cotton-spinning. One of the first cotton-spinning mills in Scotland was erected in 1780 on a site adjacent to the "lade" which runs from Loch Fad, nearly opposite to the present Ladeside Mill. The incipient stages of this industry were nothing very wonderful, but in course of time more extensive works were erected, and the business was prosecuted for about fifty years with tolerable success, until the dearth in cotton, caused by the American civil war and several concurrent causes, brought about the stoppage of the works, which have never been re-opened, and are indeed now partially demolished.

The weaving trade was once represented in Rothesay by three mills, but about eight years ago the Vennel Factory suspended operations, and within the last two years the Broadcroft Factory has followed its example, so that there is now only the Ladeside Mill working. Various causes might be assigned for the cessation of this industry, but the chief are perhaps the isolated position of the town and the great improvements recently effected in the style of machinery, against which less modern machinery is not able to compete.

The general adaptation of steam-power to shipping dealt a severe blow to the timber shipbuilding trade, which was carried on in Rothesay with great success for a long period of years. This business latterly was represented by two firms engaged in separate branches of the trade; the "Town Yard" dealing specially in those small vessels of from 100 to 150 tons register, known as "Coasters," while the "Ardbeg Yard" was chiefly employed in the building of fishing-smacks. The failure of the west coast herring fishing during the past ten years has, however, ruined this branch of the trade; and although the building of the coaster class of vessels might have been persevered in, the

compulsory removal of the "Town Yard," some few years ago, to make room for the esplanade, has extinguished that branch also.

But notwithstanding the collapse of these industries, the prosperity of the town has not to any extent been impaired. Rothesay, it is well known, is a favourite summer resort of the Glasgow folks; large numbers of them flock to it yearly in quest of health and recreation, and this has been a means of great advantage and prosperity to the whole town and island. Many trades and interests have been fostered and advanced by it, and amongst these, as may naturally be supposed, the agricultural interest has come in for its due share of advantage. As it is with this interest that we are chiefly concerned, we will now proceed to remark more particularly upon it, making in the first place some few observations on soil and climate.

### *Soil and Climate.*

The characteristics of the soil in Bute vary greatly. On the east side of the island it is of a sharp gravelly nature, and rests on a substratum of red sandstone. Going north along the west side of Port-Bannatyne or Kames Bay, the land lies very steep, and with the exception of the fields along the shore, where the soil is deeper, and the subsoil a gravelly clay or slate, the whole of the ground is thin, and rests on a subsoil of red till. Passing through the valley from Bannatyne Bay to Ettrick Bay, the soil is still gravelly, but is much deeper, and large patches of loam are to be found. The deepest soil in the island lies along the Bay of Ettrick, where there is a depth of about 3 feet of earth, and a bed of gravel lying under. Fifty years ago this was a huge marsh, and a bed of moss still runs along the greater part of the farm of Mid St Colmac. In the valley of Glenmore, large patches of deep moss and loam are scattered over the fields, and a turnip crop has been grown in this year (1880), in this glen, which will compare favourably with any in the island.

In the Commertmenoch district, comprising the farms of Larichorig, Baluachrach, Dunalunt, and Balichrach, the soil will be found to be representative of all the different kinds of soil in the island. The farm of Balichrach is admitted to be the most regular crop-producing farm in the island, and on Ballycurrie, the soil is light, free, and very easily wrought. In Kingarth, especially along the valley from Scalpsie Bay to Kilchattan Bay, there is also great variety of soil; on the higher grounds it is of a till and clay formation, and therefore poor, but in the straths light sandy soil prevails, and an occasional depth of good loam is met with.

Bute has been so long famed for its salubrious climate that

little need be said on the subject. Frost seldom continues long, and is never very severe; and snow lies a very short time even in the worst seasons. The salubrity of the island is so well known that Rothesay has been called the "Montpelier of Scotland." There are two very extensive hydropathic establishments, well-frequented—one at Rothesay, and the other at Port-Bannatyne.

The following figures give the rainfall over a period of years, as measured near Rothesay:—

Year.	Inches.	Year.	Inches.
1800	46·09	1870	38·10
1825	46·98	1875	...
1850	50·80	1876	56·314
1855	34·50	1877	68·597
1860	48·20	1878	42·416
1865	41·30	1879	50·426

Comparing these figures with the returns made for other parts of Scotland, we find that in 1855 the average rainfall in Bute was 34·50; in Dumfriesshire, it was 35·63; in Midlothian, 21·43; in Strathearn, Perthshire, 19·20 inches. In 1870, Bute rainfall averaged 38·10; in 1876, 56·314; in 1877, 68·597; and in 1878, 42·416 inches; whereas the gauge at Dunrobin Castle, in Sutherlandshire, gives the following measurements for the same years, viz:—1870, 26·75; 1876, 34·62; 1877, 41·65; 1878, 34·36 inches. The results of this comparison prove that the moisture of Bute is about the same as that of Dumfriesshire, and that it is very much greater than the moisture of Sutherlandshire. To take a particular point in each of the two first-named counties, the rainfall in the town of Moffat measured, in 1855, 35·60, and the rainfall in Rothesay measured in the same year, 34·50 inches. These figures speak for themselves, and give a very good idea of the general nature of the climate of Bute.

*Retrospective Glance at the state of Agriculture prior to 1850.*

From a valuable "History of Bute" written by Mr John Blain (who for sixty years previous to 1820 was intimately connected with the island), and recently published by Mr Harvey, Rothesay, very full particulars of the agriculture of Bute at the beginning of this century can be obtained. It appears that about 1748 the Earl of Bute introduced farmers from the mainland, in the expectation that the natives would be induced to adopt their system of farming. The introduction of these strangers did not, however, have such a beneficial effect as

was expected, and the landlord soon tried other experiments to improve the condition of his tenantry. Nineteen years leases were granted, and all rents were converted into money payments. In the low state of farming pursued at that time many more cattle were kept than the holdings would maintain, and the horses were of such inferior quality that six of them were employed to draw the wooden plough then used. Black cattle were general throughout the island, and were an ill-conditioned bad-milking breed. It was one of the conditions of these new leases that the stocks should be reduced, and for this purpose a public fair was appointed to be held at Rothesay for the sale of the surplus stock, of which fair the following extract from the "Glasgow Journal," of 16th April 1765, is an advertisement:—

"At Rothesay, in Bute, upon 28th May next, there will be held a market of black cattle, sheep, and horses; the market to continue till all are sold off. As most of the tenants in the island are obliged by their tacks to dispose of a third of their stock against Whitsunday next, it is expected there will be a great number of cattle there.

"For the convenience of merchants, boats will attend at Rothesay, and likewise at Scoulag Burn-foot, for carrying off the cattle sold, either to Largs, or anywhere up the river, freight free."

While the Earl was thus trying to improve the condition of the stocks by causing fewer animals to be kept, he also offered "a variety of premiums, such as, for the best bulls, for the best dairy produce, for the greatest quantity of butter and cheese produced by a given number of cows, for well-compounded compost dung-hills, and a certain sum per acre for waste land brought under cultivation." A Suffolk stallion was kept for the use of the farmers' mares, and no fees were charged for his service, and many other important improvements were promoted by this patriotic nobleman.

In 1805 or thereby his successor, following in his footsteps, and actuated by the same laudable motives, sent, at his own expense, half-a-dozen farmers' sons, bred on the island, to be educated by a Mr Walker, on the farm of Rutherford, near Kelso, and instructed in the most approved systems of agriculture then pursued in Roxburghshire. On their way east these young men passed through the country from Glasgow to Edinburgh and from Edinburgh to Kelso on foot, and were thus enabled to obtain a good general view of the whole agriculture of the counties along their route. The curriculum through which these students passed lasted for two years, at the end of which time they returned to Bute, and were furnished with farms on the estate of the marquis at reasonable rents. Their improved mode of farming,

and intelligent application of scientific principles, so far as then known, to the cultivation of the soil, excited the interest of their neighbours, and a generous spirit of rivalry was engendered, which tended to bring about a remarkable change for the better in the condition both of the farmers and of the land. As this fact seems to have been overlooked in all former agricultural accounts of the island, no apology is necessary for here inserting the names of several of the gentlemen who were the principal agents in effecting this change. They included Mr James Jamieson, who became tenant of Ambrismore; Mr Charles Stewart, afterwards of Ardrosedale; Mr John Duncan, the tenant of Meikle Kilchattan; Mr George M'Phee, North Inchmarnock; and Mr A. M'Intyre, Dunalunt.

The next most important event in the early part of this century, and one which has exercised an immense influence in improving the agriculture of Bute, was the institution of the Bute Farmers' Society. The idea of such an association was first mooted at a meeting of the inhabitants of the island, held in the early part of the year 1806, over which Mr John Blain presided, and at which he delivered an address on the state of agriculture, which is given *in extenso* at pages 274–283 of the history referred to,—an address remarkable alike for its breadth of view, its fearless denunciation of abuses, and its judicious recommendation of reforms.

The first object contemplated by the promoters of this institution was discussion on agricultural topics, but in 1807, at their March meeting, we find them making arrangements for holding a ploughing-match, and settling the amount of premium to be offered respectively for the best stallion and the best bull for breeding purposes. At the first ploughing-match ever held in the island, that in March 1806, premiums were offered by the Marquis of Bute, and twenty-six two-horse ploughs competed, each being provided with a driver in addition to the ploughman proper, but at the match held under the auspices of the Society a year later, drivers were dispensed with, and thirty-four ploughs appeared on the ground.

These ploughing-matches were in course of time discontinued, it being considered that the object they had in view had been attained, but premiums continued to be offered for the best fields of turnips, the most successful crops of artificial grasses, improvements in the breed of cattle, the best kept hedges, and the best regulated farms.

At what time this budding society, which was technically known as the Bute Agricultural Society, ceased to exist, it is difficult to determine; its last published minute is dated the 16th March 1807, but that it had been defunct for some time prior to 1820 is clear from the fact that in 1821, Mr Samuel Girdwood, then in Kerrylamont, proposed to revive the ploughing-match, and was



empowered by the farmers to collect subscriptions, and to call a general meeting of the tenantry so soon as he had collected a sum sufficient to pay adequate premiums to competitors. This scheme proved successful, and the next development of the renewed agricultural enterprise took shape on the 3d day of February 1825, when a meeting was held in Rothesay of persons friendly to the institution of a Farmer's Society. The result of this meeting was that the Society which still exists was founded, having for its object the promotion of agricultural improvement in all its branches, to be attained by the granting of premiums, the formation of a library, and the holding of meetings for discussions on agricultural topics. This Society has done very much towards the furtherance of agriculture. By the premiums offered for dairy cows of pure breeding and good milking qualities it has fostered dairy-farming, till it is now almost in as flourishing a condition as could be desired. By the introduction of good Clydesdale stallions it has enhanced the value of the draught horses, and by its premiums for the best fields of turnips, &c., it has greatly increased the profitableness of green-cropping in the island.

### *Modern Farming.*

As Lord Bute may be said to have been the principal agent in abolishing the last remnants of primitive farming, and Mr John Blain may be said to have been the forerunner of scientific farming, so the honour of being the inaugurator of the modern era in Bute farming must be awarded to Mr Samuel Girdwood. This gentleman about forty years ago held the offices of steward to Lord Bute and secretary of the Farmers' Society, and was also tenant of the farm of Kerrylamont, in Kingarth. He was a man of more than average intelligence, of great force of character, and possessed of unbounded enthusiasm in the furtherance of a favourite pursuit. His tombstone in Rothesay churchyard tells us, that he was for forty years connected with the estate of the Marquis of Bute; "distinguished by fidelity in his trust, ability, skill, and success in the discharge of his duties, and zeal for the public interest." Under his fostering care the Society progressed wonderfully, and by the introduction of furrow drains and the system of liming, the reclamation of waste lands was vigorously prosecuted. Through his instrumentality, a lime-kiln was established at Kilchattan Bay, and the limestone found in the island was there burned and utilized, and a premium was offered by Lord Bute for the best heap of composite manure, *i.e.*, of farmyard manure, mixed with such waste as the sweepings of the farmyard, and the "scubring" of the roadside drains, &c. On the farm of Kerrylamont he carried on various experiments, the results of which, when successful, were communicated to the farmers. In order

to facilitate interchange of opinions by practical men on agricultural questions, Mr Girdwood, in conjunction with Mr Alexander Anderson, the first letterpress printer in Rothesay, issued, on the 26th November 1839, the first number of the "Bute Record of Rural Affairs," a publication which continued to be issued regularly until January 1846, and which in its republished form (1860) furnishes an excellent reference work to the student of agricultural progress in Bute.

Having thus brought the review of the agriculture of Bute prior to the period on which we are asked to report to a close, we now proceed to give somewhat in detail particulars of farming operations during the past twenty-five or thirty years.

The system of farming differs little if at all from that commonly pursued in the west of Scotland. The rotation of crops at, and some time previous to the commencement of the period reported on, was what is known as a seven years' shift, i.e., the ground lay three years in pasture, and four under crop, but for the last twenty years or more a six years' shift was substituted; in all the new leases, however, the seven years' shift has again been reverted to. The land lies under pasture for three years; it is then broken up by the plough, and the fourth year an oat crop is sown; the fifth year it is green cropped; the sixth year it is sown down with oats or barley and rye-grass and clover seed; and the seventh year a crop of rye-grass and clover is taken off. No two white crops are allowed to be taken off in succession without the consent of the landlord.

Taking these crops in the order of their rotation we are first called upon to give a few particulars of the

### *Oat Crop.*

The established custom for the last fifty years has been to import for seed purposes Midlothian "potato" and "sandy" oats from the Edinburgh markets. On the higher lands, where the ground is shallow, and of a heavy clayey nature, "sandy" oats are invariably sown, and on the deeper and more fertile lands scarcely any but "potato" oats are produced. "Hamilton" oats are found to grow admirably on the light soils of Kilchattan Bay, and weigh about 42 lbs. per bushel. The land is broken out of grass during January and February, and sowing is begun in April, and thought to be completed in good time when the seed is all in by the 20th of that month. In the north-east of Bute damage is often done to the growing crop during the month of June by gales of east wind, which shake the grain when in flower, and although the bulk of straw is often very great, the result of thrashing is many times disappointing. The crops are generally first harvested in North Bute,—not that the soil there

is capable of raising earlier crops than the soil in Kingarth, but the farmers on the east side of the island give all their attention in the early part of spring to the potato crop, whereas generally throughout the rest of the island the farmers give equal attention to white and green crops. The reaping-machine is now, and has been for many years, in use on almost every farm in Bute, and very few acres are now cut with the scythe or hook, and these only when the crop has been much flattened by the storms. The first who introduced a successful reaping-machine was Mr John M'Dougall, the tenant of Kerrytonlia who purchased one of Jack's reapers about twenty or twenty-five years ago. A very few acres may occasionally be let to Irish reapers by the acre, but this mode of harvesting is now nearly obsolete. The hands necessary for the management of the farm during the year are usually equal to the extra demands of harvest time, but if additional workers are necessary they can easily be procured in Rothesay.

The average produce of oats per acre in 1855 was 32 bushels, and the average of fiars prices for the seven years ending 1856, was 23s. 6½d.; the average produce per acre in 1880 will be about the same as in 1855, and the average of fiars prices for seven years ending 1876 was 24s. 6½d. per imperial quarter. Over a period of years the bushel of oats will weigh on an average about 40 lbs. and when ground a 6 bushel bag of oats usually yields 140 lbs. of meal. The habits of the people of Bute have greatly changed during the past twelve or fifteen years, and whilst formerly a large proportion of grain was ground into oatmeal, now only a very small proportion of it is devoted to this use.

#### *Green-Cropping—Potatoes and Turnips.*

The early history of green-cropping in Bute is interesting and instructive. As we have seen, the chief proprietor early gave tangible proof of his interest in the improvement of agriculture, and the Highland and Agricultural Society, as well as the local Farmers' Society, later on, did something to encourage the growth of green-crops. The National Society, in 1851 and 1852, and in several following years, offered premiums for the best managed green crop in the island, and in 1868 a premium was offered by the agent for the best 2 acres of turnips and potatoes grown with Goulding's manures. The Highland Society's medals fell to the lot of the tenant of Mid Ascog in 1851, 1852, 1854, and 1855, and the premium offered by Goulding was also awarded to him. Prizes of a like nature were awarded on different occasions by other donors, and the competitions for them did much to make the farmers bestow increased care on these important crops.

For many years Bute has been known as one of the earliest places in the west of Scotland for the growth of potatoes. These

favourite roots grow well on the sharp gravelly soil of Kilchattan Bay and Kingarth, and the farmers in that district vie with each other in sending the earliest potatoes to the Glasgow market. In the spring time potatoes used to become rather a scarce commodity in Bute, but the advent of the "Champion" potato has somewhat obviated the danger of a local famine of these vegetables. "Red Bogs" is the principal variety planted for sale in the early markets. The average price of early potatoes is about £18 per acre; although in Kilchattan Bay from £20 to £24 have been obtained in an exceptionally good season. The buyer digs the crop, and the farmer drives to the place of shipment free of charge. On some of the shore farms the stubble is during winter covered with seaweed, but in general it is ploughed down or grubbed about Martinmas, and again ploughed in February. Potatoes for early sale are planted as soon as possible after the end of February. The width of potato drill is from 25 to 26 inches, the latter figure being the standard. The crop is in most cases sold to dealers from Glasgow, and the frequent communication between Bute and the mainland—steamers sailing hourly during summer,—admits of the crop being lifted and transported to Glasgow in a very short time.

In the extreme northern portions of the island and in the more exposed situations, potatoes are only grown in quantity sufficient to supply the wants of the family. On one of the farms in Kingarth, in 1880, a fair crop of barley has been raised on a field on which a crop of early potatoes was grown. The potatoes were lifted about the middle of June, and the barley was sown on the 26th and 30th of the same month. This is rather an unusual proceeding (rape-seed being generally sown on the potato ground), and its success will be watched with interest.

### *Turnips.*

The growing of these favourite feeding-roots forms a large part of the agriculture of Bute. Turnips were first introduced into Bute by Mr Knox, then tenant of Kerryllamont, in 1800.

The sorts now in most common use are purpletop swedish and greentop yellow, and about one-half of the breadth under turnip crops is sown with the former, and the other half with the latter variety. As a rule the whole produce of the crop is consumed by the stocks on the farms, but a good exportation trade is carried on by some of the farmers. The turnips are shipped in bulk, and sold in Glasgow and Greenock.

The average width of turnip drill is 27 inches. In the south end of Bute the turnip crop has—since the growing of early potatoes assumed its present important position—been chiefly grown with artificial manures, as the farmyard dung is all

required for the earlier crop. In North Bute and Commertmenoch, where less attention is given to the early potatoes, an effort is made to sow the crop on manure formed of an equal proportion of byre and stable manure and artificial stuffs. Generally it may be said that the farmers are now using more ground bones than formerly, and within the last few years it has become necessary to use a good deal more town manure, and on one farm in Kingarth, in the winter of 1879, upwards of 400 tons have been spread.

For the storage of the turnip crop during winter different plans are adopted. On the eastern side of the island the produce of two drills is gathered into one furrow, and covered over by the plough. On the western side the turnips are only taken out of the ground as they are needed, the earth being put up to them at the beginning of the winter. The system, so successfully carried out in Dumfriesshire, of feeding sheep on the growing crop, has been tried in Bute, but on account of the moistness of the climate it was found very unprofitable, and the practice has been discontinued.

The average yield of turnips per acre in 1855 was 15 tons 11 cwts; the average yield of swedish turnips in 1870, about 18 tons; and of yellow, 14 tons. For thinning turnips the services of female workers can be secured at about 2s. per day, and of male workers at about 2s. 6d. per day; in both cases without food.

Summing up the report on green-cropping, it must be said that the most unprofitable branch of farming during the last ten years has been the growing of early potatoes, and those farmers who have bestowed more attention on the turnip crop are to-day better off than the others, and their farms are in much better condition. Turnips leave the soil in much better condition for the growth of the next crop, and one can easily distinguish by the appearance of the white crop whether it has been sown on potato or on turnip ground.

### *Barley.*

Up to within a recent period wheat was extensively grown in Bute. About the time of the Crimean War white wheat was grown, and was the most successful and most profitable crop raised in the island. Seasons were then very favourable, prices were high, and on one of the most northerly farms the average of 48 bushels per acre was realised on a field of 10 acres. Barley, however, has for the last twenty years more or less been increasingly cultivated, and, as a result, has now almost entirely supplanted wheat. The reason for this change of crop has chiefly been this: the ready market which is found for barley in the

distilling districts of Campbeltown and Islay, and the increasing foreign supplies of wheat, which have rendered it more profitable to grow barley. The change of crop has also proved beneficial in another way: it has tended to the good of the soil, because barley keeps the ground much cleaner, and does not take so much of the strength out of it as wheat.

The red land alone is sown with barley; indeed, it may be said that, with the exception of the moorland farms, all the sown-down land is cropped with it. The variety sown is in general that known as common barley, although in the north end, and wherever the land is strong and in good condition, the farmers prefer the "Chevalier" sort, as it is the more profitable.

Experience has taught the farmers in Bute that home-grown barley is ill-adapted for seed purposes, and consequently all the seed is brought from Midlothian. The heads of the home-grown seed become black, and the yield is not up to what might be expected. The Midlothian grain usually weighs about 56 lbs. per bushel, and the average weight per bushel of the barley crop is from 52 to 54 lbs. Barley harvest in a fairly good season begins about the 15th of August, and the crop in the south end is commonly hatted in the fields, and thrashed off the huts by the large thrashing mills, two of which travel the island in circuit. In the north end the crop is stacked in long stacks placed four abreast, and containing about twenty cartloads a-piece. The mill stands between the two inner stacks, and the tops being taken off these, the sheaves from the outer stacks are forked on to them, and from them on to the machine. The outer stacks being thus disposed of, the sheaves of the inner are then passed through the mill. The barley straw on being thrashed is stored in long square stacks, and is used during winter in various ways. Some of it is cut into chaff, steamed, and mixed with meal and turnips for feeding purposes; the rest of it is used for "litter," and a little of it for thatch.

### *Rye-grass.*

When land in Bute was newly reclaimed great quantities of rye-grass seed were ripened and sold for exportation. At that time the ripening of rye-grass seed was one of the features of Bute farming. Sometimes the yield per acre has been known to be as high as 6 quarters. In 1853 the Highland and Agricultural Society's medal awarded for the best sample of perennial rye-grass seed grown in Scotland, was gained by Mr James Duncan, Rhubodach; and in 1854 the same medal was gained by Mr John Stewart, Baluachrach, in Commarmenoch district. The average yield per acre will not now be more than 2 quarters; the great majority of the farmers cut their hay green and winnow it, and the ripening of it is only permitted on such farms

as are best suited for the process, when the crop is exceptionally clean. The weight per bushel of this season's (1880) rye-grass seed averages from 23 lbs. to 28 lbs., and the price realised for it is from 1s. to 1s. 3d. less per boll of 4 bushels than the price of that sampled in Ayrshire.

Rye-grass seed is invariably mixed with clover, and the second growth of clover in a season such as 1880 could hardly be matched in any part of Scotland. On Mid Ascog and Colmac this season (1880) there has been a crop of great bulk, which has been winnowed and stored for fodder.

### *Cattle and Dairy-farming.*

The native breed of cattle in Bute, which were presumably of Highland origin, although many of them were polled, have long been superseded by the Ayrshires. Dairy-farming is one of the principal departments of the rural economy of the island, and as the demand for dairy produce increased, so it became the interest of the farmers to meet it by improving their herds, and increasing the milking qualities of their cows. We are able with tolerable certainty to establish the date when the first Ayrshires were introduced. The earliest occasion on which a prize was specially awarded at the annual show for Ayrshire cows was in 1830, but the breed had been in the island fully a quarter of a century before that date. Among the first, if not the very first, to introduce Ayrshires, was Mr Thomas Stevenson, who in 1803 came from Neilston, in Renfrewshire, to the farm of Edinmore, and brought with him a number of Ayrshire calves, which were brought over by ferry from Largs to Scoulag, and were then travelled across the island to the west side, near Colmac. Mr William Barr also came from Ayrshire about the same time, and brought with him a small stock of the breed of his native county. These gentlemen were followed soon after by Mr Johnstone, the father of the present tenant of West St Colmac, who came from West Kilbride, Ayrshire, in 1809, and by Mr Robert Hunter, Mid St Colmac, also an Ayrshire man, both of whom brought herds of pure bred Ayrshires with them. The cattle brought in by these strangers must have soon commended themselves to the natives, because we find that the Stewarts of Balichrach and Baluachrach, who are said to be a family resident in Bute for about three hundred years, have long had excellent herds of Ayrshire cows. The herd presently on the farm of Baluachrach or Upper Ardroscaidale, was founded by the late Mr Robert Stewart in May 1833, from purchases made in the island. A bull was bought from the late Rev. Alexander M'Bride, minister of the parish, and afterwards of the Free Church, North Bute, which greatly improved the breed, and sires have been introduced from the mainland which have main-

tained its superiority. Mr Stewart was awarded the first prize, twenty years ago, for the best aged cow in milk, and also a silver medal as owner of the best six cows shown.

In 1856 a selection of Ayrshire cows was made from herds in Bute, and sent over to the Paris Exhibition as the joint adventure of several farmers. The cows were all sold at a good profit, and one selected from the herd of Mid Ascog, was awarded the bronze medal as one of the best cows in milk in the exhibition.

The Mid Ascog herd was founded about 1850, with cows purchased in the island, and its superior milking qualities were maintained by the use of bulls from the herd of Mr Murdoch, Carntyne, near Glasgow. Up to about 1870 only bulls from this herd were bought in, and during that period many of the leading prizes at the local show were awarded to Mr M'Allister, the tenant of Mid Ascog. From 1859 to 1880 scarcely a year has passed without his gaining medals for his Ayrshires, and the trophies won by him can hardly be enumerated. After the Carntyne herd was dispersed bulls were purchased from the Burnhouses breed, and by the exercise of great care in mating sires and dams the excellency of the herd has been maintained.

The herd of Mid St Colmac, owned by the late Mr Alexander Hunter, and formed from stock brought from Ayrshire by him, was one which for many years upheld the credit of Bute dairy cows in showyards all over Scotland. After the death of Mr Robert Hunter the farm was carried on and the stock greatly improved by his son, and at his death a few years ago it was sold by public auction, and the prices realised were the highest ever obtained at a dispenishing sale in Bute. The three-year-old queys drew very high prices, and three of them sold respectively at £33, £28, and £25 a-piece.

Several of the highest priced animals were purchased by the present tenant of the farm, and with the herd founded by his father, Mr James Simpson, on Largivreehtan about thirty-four years ago, they now form the magnificent herd of forty dairy cows on Mid St Colmac. The Largivreehtan herd was founded from purchases made in Ayrshire, and from cows purchased from Mr Lochhead, Toward, Argyllshire; the bulls have almost invariably been purchased from the tenant of Boydston, Ardrossan. One of these bulls was the sire of twenty prize animals, and several high priced cows have at times been added to the herd, including the famous cow "Joan," bred at Knockdon, and sold at the Auchendennan sale of Ayrshires some few years ago.

The Bute herd, however, which has come most to the front in shows on the mainland in recent years is that of Meikle Kilchattan. This herd was founded fourteen years ago from purchases made in the island. Bulls have been used bred by Mr Scott, Plane Farm, Bute; Mr Ivie Campbell, Dalgig, New Cumnock; Mr



Fleming, Castleton, Carmunnock; Mr Brown, Cartleburn, Kilwinning; and Mr Howie, Burnhouses. These were all good breeding sires, but the Cartleburn bull effected the greatest improvement in the breed.

As these dairies touched upon, are, with Balichrach, the most extensive in the island, the details of the way in which their quality has been maintained may serve as an indication of the general method of breeding Ayrshires followed in Bute. Queys are seldom or never bought in, but bulls almost invariably are. The quey calves are all kept to keep up the herds, but the bull calves, unless very promising, are sold as unfed veal to the butchers. As a rule the aged cows are not kept after they are ten years of age unless they have proved themselves to be extra valuable as breeders. Cows which calve in autumn sell at about £15 per head; those calving in spring draw from £12 to £14.

The produce of the Bute dairies is either sold as sweet milk or manufactured into fresh butter, for both of which there is an abundant demand in Rothesay, Port-Bannatyne, and Ascog. A good deal of fresh butter is also sent out of the island. A boat crosses from Kilchattan Bay to Millport with supplies of butter, and quantities are also sent to Dunoon. When the dairy trade began at first to develop itself in 1810, the milk was all sold skimmed; after a time a demand arose for mixed "skim" and "sweet" milk, and again butter milk was in favour; but for many years sweet milk has been exclusively in demand. Cheese was somewhat extensively manufactured in former times. The writer of the "Statistical Account," in 1840, tells us that the "cheese then made was equal to the best Dunlop," but this remark does not now hold good. Bowing establishments are very rare; the farmers generally sell the produce of their dairies without the intervention of any middle party, as by this means they receive about 2d. a pound more for their butter than they would by selling it wholesale to merchants in Rothesay. The first farmers who sold milk from carts in the streets of Rothesay, were Mr John Currie, then in Ardbeg, and Mr Thomas Stevenson, Ardmalish. Fresh butter sells out of Rothesay at about 1s. 5d. per lb. on an average, and fresh country eggs, sent from Bute at about 1s. per dozen. In Rothesay the consumer can purchase butter produced by the Bute dairies at about 3d. a lb. less than he would pay in Dunoon or Helensburgh, as the supply in the island exceeds the demand.

The price of sweet milk, wholesale, is about 4d. per imperial pint; of fresh butter, wholesale, about 1s. 2d. per lb., retail, 1s. 4d. to 1s. 6d.

As there is not a market for all the butter milk churned in the island, for the last twenty years it has been usual for many of the farmers to make the sour milk into a curd for dye, which is

sold to merchants in Glasgow. The milk after churning is put into a large vat, and a slow fire being put under, it is allowed to remain there for two days; at the end of that time, being now formed into a curd, it is taken out and put into a suspended bag, by which means the whey is allowed to drip out of it. It is afterwards taken down, and put under a cheese-press for a time, and is then sent off to the Glasgow market. The price received for the curd is from 18s. to 20s. per cwt. which is about equal to three farthings a pint, or within a fraction of the price usually obtained for butter milk. The sour milk whey is mixed with meal, and forms excellent food for the pigs.

### *Sheep.*

Sheep-farming is not very extensively followed in Bute. All the farms carrying pure bred stocks are in the north end, and the chief of them are Rhubodach, Kilmichael, Hilton, and Glenmore. The stocks carried on these hills are mixed flocks of blackfaced ewes and wethers. A little more than thirty years ago several of the farmers sold off their blackfaced sheep and bought in Cheviots, but it was found that the Border favourites were very unprofitable, and for the last twenty years there have been few or none of them in the island. An experiment was also tried on one of these farms with crossing blackfaced ewes with Leicester tups, but on account of the difficulty experienced in keeping up a blackfaced stock the experiment was abandoned. Thirty years ago the sheep on the Bute hills were very small and ill-conditioned, but, chiefly through the energy of Messrs Crawford and Duncan, the tenants of Kilmichael and Rhubodach, by the selection of good tups from the mainland, a great improvement has been effected in their quality. The tups in use are for the most part bought in from the flocks of Craigton, Milngavie, Foyer's, Knowehead; and Jardine's, Campsie.

The tups are generally let out with the ewes about the 20th November, and the lambing season extends from the middle of April to the middle of May. After going with their dams between three and four months the lambs are weaned, and about the middle of August all the tups and stock lambs are dipped with the usual compositions. The lambs are kept from their dams for about eight days, at the end of which time they are sent off to the hills again, and usually find their old quarters. At weaning time the weakest of the lambs are sold off to graziers, who winter them and sell them in the ensuing autumn as hoggs, to make up the stocks on farms where cross-bred lambs are reared.

The "cast" ewes are drawn about the 1st of October, and dipping begins about the same date. For dipping, a trough is in

use into which two sheep can be put at once, and by this means the work is got over very expeditiously. Smearing has now been almost universally abandoned, because of the amount of extra time and labour it involves; though occasionally black-faced ewes are smeared with a mixture of tar and butter, in the proportion of 1 gallon of tar to 6 lbs. of butter—a quantity sufficient to smear six sheep. The clip after smearing with this composition generally yields about 6 lbs. of wool per fleece. Clipping begins about the middle of June, and is continued till the end of the month; the milk ewes are about a fortnight later of being clipped than the others. Taking an average over ewes and wethers, the produce of the clip will give about five fleeces to the stone of 24 lbs. Wethers in some cases will occasionally give a clip of 8 lbs. of wool.

The average rent paid for purely sheep farms is about £18 per every 100 sheep carried. The prices realised for shot lambs range from 6s. to 8s. per head; for draft ewes, from 16s. to 18s. each; and for wethers, about 31s. per head.

On several of the arable farms which have also a piece of moorland included in them, another branch of sheep-farming is carried on. The tenants of these farms buy in at the beginning of winter a number of cross-bred or half-bred hogs, which they winter on grass, with the addition of a few turnips and a little corn, and sell again in summer to the butchers. Some sell before clipping, others after having taken off the fleece. These hogs are bought in at prices ranging from 20s. to 30s. a-head, and are sold after the six or seven months' keep, at prices averaging from 40s. to 50s. each. These hogs, unclipped, now sell at about 1s. per lb., clipped hogs, at about 8d. or 9d.

A few Cheviot ewes are kept on one or two farms, and are crossed with Leicester tups, for the supply of cross-bred lambs for the butchers. The lambs are sold about the middle of June, and draw about 30s. a-piece. The ewes, when the lambs are taken off them, are fed off, and, if fat, draw about 5s. a-head more than the price for which they were purchased. Sometimes the difference between the buying and selling prices of these ewes is even greater than 5s., and when the value of their clip is taken into account, it is apparent that this system of sheep-farming is by no means unprofitable, and many farmers think it should be more generally adopted. It has now been pursued for the last twenty or thirty years on two or three farms. One of the tenants keeps Cheviot ewes in stock, shoots out the slack ewes, and buys in hogs to maintain the stock; the others sell off the ewes and buy in a new lot every season. Sheep are brought in now from Argyllshire in October, to be wintered for six months at 6s. 6s. a-head. Whether this is profitable or not for the land it puts money into the farmers' pockets for the time being.

*Pigs.*

In the table at the commencement of this paper we have given the relative numbers of pigs in Bute in 1855 and in 1879, and it only remains further to be added here, that these animals are only kept to the extent of one or two on each farm, for the purpose of consuming the waste about the kitchen, and that pork-feeding forms no part of the rural economy of the island.

*Horses.*

During the last quarter of a century there has been little change in the quality of the horses bred in Bute. For some time prior to the period reported on, and during it, the farmers have been fortunate in securing some of the best Clydesdale stallions ever known in Scotland to travel their island. The Sproulston horse "Farmer" (Stud-book, 290) was the first to effect a marked improvement in the quality of the stock, and after him "Round Robin" (721), "General Williams" (326), and "Young Clyde" (1360), greatly increased the value of the young horses reared in the island. In more recent years "Surprise" (845), "Young Lorne" (997), and others, have been secured by the Farmers' Society to travel under their auspices. "Druid" (1120), the well-known champion horse of 1879 and 1880, also was engaged by the Bute farmers, when a three-year-old, in 1878. The best horses are undoubtedly to be found on the west side, on the deep land of Ettrick Bay, but the east side has also come to the front through the reputation of the famous mare "Rose of Bute" (89). Horse-dealers visit the island regularly, and buy up any of the stock which may not be required for home purposes. Generally the mares are not of the largest size, and there is an apparent lack of the finely flowing fringe of hair on the legs, so much accounted of by Clydesdale fanciers. Clydesdale mares were introduced into Bute by Mr James Simpson about forty years ago, but whether these were the first pure bred importations we have not been able to ascertain. It must be between thirty and forty years since "Farmer" (290) travelled the island, and "Round Robin" (721) was there in 1854 and 1855. About this latter date Mr Robert M'Allister, Mid Ascog, held a leading place in the local show with his mares, and bought in one from the stud of Mr Robert Findlay, Springhill, Baillieston, which bred many excellent animals. At the time when Mr Simpson came from Ayrshire, and "Farmer" (290) was travelling, the native breed must have been somewhat inferior, and in all probability of Highland origin, because the very first year Mr Simpson was in Bute he gained the prize as the owner of the best pair of mares at the ploughing match. It is questionable if very

heavy mares could be raised in Bute; the soil is not so well adapted for grazing purposes, and the pasturage is very bare compared with that of the fertile lands of Galloway and Kintyre, and, therefore, so long as the needs of the island are best served by a horse somewhat light of limb, the present breed may be considered the best for all purposes. The farmers find a ready market for their surplus stock, and mares from Bute have been sent all over Britain, and even to the colonies. With the produce of such horses as "Druid" (1120) and "General Neil" (1143) coming up, there should be little danger of the stock being deteriorated.

### *Draining and Liming.*

The first draining operations of any extent carried on in Bute were commenced more than fifty years ago by Mr Kirkman Finlay, who at that time was proprietor of the lands of St Colmac. The farm of West St Colmac was the first that was drained in Bute on the Deanston principle, and all the deep land on the level fields around Ettrick Bay were reclaimed from a state of unprofitableness. A drain plough was introduced by Mr Finlay, but it proved unworkable on account of the number of boulders buried in the marshes. There is double the extent of arable land in Colmac now that there was forty or fifty years ago, and what was then considered good arable land has been very much improved by lime and draining.

When Mr Samuel Girdwood began reclamation works on the Bute estate he encountered much opposition from the indifference of the farmers in seconding his efforts to improve the soil. He broke ground on the farms of Cranslagvourarty and Largivrechtan, but the tenants of those days were not able to see the force of all his blasting, digging, and draining labours. In their hands the dry patches on the hillsides were cultivated, but wherever nature asserted her supremacy by the presence of whins and marshes, no efforts were made to battle against her. Whins, rocks, and brushwood were left to the freedom of their own will, and stagnant bogs remained untouched. Mr Girdwood succeeded in convincing the tenants that it was for their advantage to clear the land, and the result in the case of one of them at least was, that when he went out of the farm he went with something very like a fortune.

About thirty years ago it was customary for the proprietor to pay the tenant who broke new land a premium of £5 per acre, but he gave him no lime. On the farm of Kerrycrov, in Kingarth, upwards of 20 acres of waste land have been reclaimed during the past twenty or twenty-five years, and all the steep land lying along the hillside on the farm of Kilbride, in North Bute, has been

reclaimed within the same period. About ten years previous to that time 40 or 50 acres were taken in on the farm of Mid Ascog, and margins of moorland have throughout the island been reclaimed. Previous to the last eighteen years, when the land was much drained, farmers received half value in lime for the expense of draining done by them, but since that time they only receive half value for lime used in reclamation, and all drains are made by the landlord, the tenants paying 5 per cent. interest on the outlay. Much of the soil that has been drained is so thin, that in many cases the interest payable increases the rent so much that farming is made unprofitable both to landlord and tenant. There are tile works situated in the parish of Kingarth, from which drain-tiles can easily be obtained, and a lime-kiln, which many years ago was in operation, has again commenced burning the limestone found in the island. The farmers in the south end prefer Bute lime because it does not require shipping, but those in the north end find they are as cheap to use Irish lime, as in either case shipping has to be resorted to, and the quality of the Irish shells is much superior.

### *Ploughing and Manure.*

The common single furrow plough is that most in use in Bute. The plough is in most cases drawn by two horses. Subsoil ploughing is seldom practised, but in general throughout the island there is no subsoil to plough. Stubble land is ploughed shortly before and after Martinmas; pasture land is broken about the beginning of January; and red land is turned over as near the time for barley sowing as possible.

Iron harrows are mostly, if not altogether, in use in the island, and chain harrows are also common. Grubbers and drill harrows of the usual kinds are generally in requisition, and some farmers grub the stubble land at Martinmas with the three-horse grubber instead of ploughing it.

Artificial manures have been greatly in use in Bute both for raising potatoes and turnips, but especially the former. Peruvian guano, ground bones, and within recent years "Blood" manure have been put into the soil, and the fact is, too many artificial stuffs have been employed, and now many of the farmers are importing large quantities of town manure from Greenock. Upwards of 800 tons of long and short town dung were put on farms in Kingarth in the winter of 1879, and this kind of manure is gradually supplanting the other. On land where much artificial manure has been used lime has not the same effect as it had when the land was reclaimed, and in many cases liming in recent years has not been remunerative. Long dung can be purchased in Greenock and laid on the fields in

Bute for about 7s. per ton ; short dung or ashes for about 3s. per ton. If purchased in Rothesay long dung can be laid on the fields for 6s. a ton, and the police manure is given to the farmers for taking it away.

### *Pasturage.*

The pasturage of Bute enjoys no great reputation, and purely pastoral farms are very scarce. Within recent years the tenant of Rhubodach, Kilmichael, and Bannatyne Mains, has maintained the last named farm as a grazing farm by top dressing with short dung and farmyard manure, mixed with lime and ground bones. Ayrshires, Highland bullocks, shorthorns, Galloways, and Canadian cattle are grazed on this farm, and fattened for the markets. The only other grazing of any extent is around the Mount Stuart policies, and it is let to farmers and others for grazing young stock.

### *Wages.*

As in the rest of Scotland so in Bute the cost of working a farm has almost doubled, in respect of wages, within the last twenty years, and were it not that, with machinery in use for almost every purpose, fewer hands are required, it is difficult to conceive how farming could be carried on, rents also having increased so much until recently. Married ploughmen in Bute at present are receiving 18s. per week with a free house. Female servants, good milkers and field workers, boarded in the house, are paid from £8, 10s. to £9, and lads receive from £8 to £12, with board, per half-year ; About twenty-five years ago the same class of women servants were receiving about £3, 10s., and lads about £5 per half-year with board and lodgings. Female field-workers employed thinning turnips in 1880 were paid 2s. a-day without rations, and the same workers in harvest time received 2s. a day with rations. Men employed during harvest time received from 6d. to 1s. a-day more than the women, with their rations, and full wages whether the weather was wet or dry. The wages of these workers in 1880 were just about double what they were in the years from 1855 to 1860.

### GREATER CUMBRAE.

Having thus exhausted our information regarding the agriculture of Bute, a few particulars of the island of Cumbrae may best be inserted here before proceeding to write of the agriculture of Arran. Cumbrae has everything in common with Bute, but little or nothing in common with Arran. The island lies 4 miles east of Bute, and 2 miles west of Largs, in Ayrshire. It is  $3\frac{1}{2}$  miles in length from north-east to south-west ;

its breadth is 2 miles, and its circumference from 10 to 11 miles. According to the measurement of the last Ordnance Survey it contains 3120·597 acres.

The climate is agreeable, being less moist than the mainland or Arran, and very salubrious. The geological formations are whinstone, freestone, and limestone. The soil is varied; on the higher parts of the island it is light, gravelly and thin, bedded on moss, and covered with heath; in some of the valleys rich loam pervades, and produces good crops. Along the east coast it is light and sandy, and in the south of the island it abounds in marl.

The island is owned by the Marquis of Bute and the Earl of Glasgow. All the old part of Millport is built on Lord Bute's estate, which extends from Newton Bay across by Barbary Hill to Fintry Bay, and includes all the land between this line and the west coast; the rest of the island belongs to Lord Glasgow.

Along the north end of the island, on the farm of Port Roy, great improvements have been effected within recent years by draining and liming. Good crops are raised on the new land, and wheat is very extensively grown. Early potatoes are cultivated with somewhat similar energy as in the east of Bute. Cumbræ potatoes, however, are about a fortnight later of being ready than those in the earliest parts of the sister island. On the top of the second terrace which rises on the west side there is some very deep land, and good crops of turnips are raised on it. Lime has not been very largely introduced into Cumbræ, but great quantities of sea-weed are spread on the fields.

All the farms on the island carry stocks of dairy cows numbering from 20 to 40. The milk is for the most part sold as sweet milk in Millport, where there is a brisk demand for it during summer. A few of the dairy-farmers churn, but not regularly, and one sends his milk to Glasgow.

The stocks on the farms are in good condition; there is only one sheep-farm in Cumbræ, and it carries a blackfaced stock of average quality. The horses are much the same as in Bute, and Ayrshire cows alone are kept for the dairies.

The burgh of Millport, situated at the south end of the island, is one of the best frequented watering-places on the Clyde. The influx of visitors during summer is very large, and communication between Glasgow and Millport is kept up six times a day by the steamers in connection with the Wemyss Bay Railway Company's trains.

The assessable rental of Millport in 1865, the year following that in which it was created a burgh, was £5,451; in 1870 it was £7,519; in 1872 it was £8,710; in 1875 it was £10,581; in 1877 it was £11,401; in 1880, it is £12,998. In fifteen years, it will be seen from these figures, it has more than doubled its rental.



and there is every prospect of its progressing as rapidly in future. Leaving now the beautiful islands of Bute and Cumbræ, it only remains for us to add that, with the maintenance of the same cordial relationship between landlords and tenants, which has so long obtained, and the fostering of that spirit of enterprise which has actuated the labours of the farmers during the past twenty-five years, still further improvements may be made, and we have every confidence will be made, in agriculture and all other industries.

#### ARRAN.

The island of Arran lies about 8 miles south-west of Bute. It is about 20 miles long from north to south, and about 10 miles broad. It is divided into two parishes—Kilbride forming the eastern section of the island, and Kilmory the western. The northern part of it is crowded with lofty granitic mountains of a conical form, connected by sharp, serrated ridges, and intersected by deep gulleys and ravines. The highest point in the island is Goatfell, which is 2,900 feet high. The southern part of the island, which is geologically divided from the northern by a band of Old Red Sandstone, crossing the island from behind the village of Brodick, is formed of undulating, hilly ground, sloping gently to the sea. The whole, with the exception of the small estate of Kilmichael, belongs to His Grace the Duke of Hamilton and Brandon, who, according to the "Parliamentary Return of Owners of Land in Scotland," furnished to the House of Commons in 1873, holds 102,210 acres in the county of Bute, the gross annual value of which then was £18,702. The Kilmichael estate consists, according to the same authority, of 3,632 acres, the value of which was £622.

The climate upon the whole is mild and moderate. Snow never lies very long; the heat in summer is not long very intense, and neither is the cold in winter. Rain falls copiously, and the prevailing winds are south and west. The soil varies greatly; one field may sometimes be found which contains patches of stiff clay, soft moss, and loam or gravel, or both mixed together. In many places along the shore, especially in the north end of the island, it is little else than granitic sand washed down from the mountains and driven back by the sea. In the more fertile regions loam is in most cases mixed with gravel, and interspersed with patches of moss. In Whiting Bay the soil is chiefly sharp the shingle resting on a subsoil of red till. The best land is in Southend and Shiskan on the west side of the island. The road to Lagg leads over the hills from Lamrash, and the road to Shiskan leads over the hills further north from Brodick.

The Holy Isle, lying in the entrance to Lamrash Bay, grazes a few sheep and goats, and the small patch of arable land at the

north end of the island is now wrought on a regular rotation of crops. Pladda, lying a short distance off the Kildonan shore on the south end, is cultivated by the lighthouse keepers, and grows the usual garden and field seeds.

*General Review of the Agriculture of Arran.*

To report on the state of agriculture in Arran during the past thirty or forty years is a matter of considerable difficulty. There has been progress made, and there has been stagnation. The larger farmers have done much to improve their holdings, some of the smaller farmers have done a little, but many of them have done nothing. Little or no encouragement to improve land is given by the superior; game is preserved to an inordinate extent, and the smaller tenantry, especially in Whiting Bay and Lochranza districts, combine the occupations of fishermen and farmers, and depend more on the letting of their houses to summer visitors than on the produce of the soil. When Dr M'Naughton wrote his "Statistical Account of the Parish of Kilbride," in 1840, he says: "In dairy-farming and the art of cultivation the smaller farmers have yet much to learn. They put little lime on their lands, neglect the cleaning and protection of their thorn fences, evade the rotation of crops laid down for them, when they can, and are not sufficiently alive to the advantages of green crops and sown grasses. Hence their fodder is scarce in winter, and their pasture defective in summer; their cattle a stunted breed, unproductive either for the dairy or the butcher."

These remarks have still considerable force. The smaller tenants do not attend sufficiently to the proper cultivation of their farms; many of them have cars which they hire in summer to the visitors, and occasionally they hang about the pierheads for hours in hope of securing hires, when they might be busily engaged working their plots of ground. Many of the farms are very small and would not support a family. When Dr M'Naughton wrote, there were in Kilbride parish, which forms the eastern half of the island, 208 farms of unequal size; 161 of these were let at rents less than £20 per annum each, 30 were let at rents exceeding £20 and under £40, the rents of 11 of them were more than £40 and less than £100, and only 6 tenants paid over £100 of rent each. Although in 1880 the number of these small farms is considerably less than it was in 1840, yet from King's Cross to Dippin, along the comparatively level land facing the south-east, there are still 52 tenants who will rank as farmers. Going round the south end of the island from Dippin the farms become somewhat larger, and several of them are of more than average size; but at Sliderry again, on the south-west side, there is another batch of small farms similar to those at Whiting Bay.

At Southend and Shiskan the farms are large, and the soil in many places will compare equally with the best land on the mainland. At Shiskan, on Balnacool and surrounding holdings, mossy loam is found in great quantities, but on Sheddog and the farms near the shore the soil is mostly a fine friable clay, with a vein of gravel running through it,—easily wrought and raising good crops. The fields at Southend and Shiskan are level, and some of the farms present rather a “scattered” appearance. Agriculture at Lochranza is still carried on on very primitive principles, and the soil is bare and poor in the extreme. The men portion of the community combine the occupations of farmer and fisherman—two callings having little in common—and after the seed is sown they leave the island to prosecute the latter, and the women are entrusted with the management of the crops and stock. A wooden plough was seen in Lochranza not very many years ago, and a woman has been seen ploughing within the past few years. At Corrie, farming is conducted on the same principles as at Lochranza and Whiting Bay.

The greater portion of the arable land is divided into fields and farms, fenced off by thorn hedges. These grow well over the island, and when properly managed form excellent fences, but in the majority of cases no care is expended on them, and as a consequence they grow high and thin, and are useless. The stocks of the small farmers—horses, cows, sheep, and even pigs—have to be tethered to prevent their straying. Many of the very small farmers have no horses; others keep one each, and get the loan of each other's animal to assist in ploughing. In Whiting Bay one or two of these farmers keep horses for hiring purposes, and they plough the plots of their neighbours during winter.

The cows on these small farms are a very mixed breed. They are neither Ayrshires, West Highlanders, Arran cows, nor Irish cows; they have the blood of all four in their veins. Irish bulls have been in use at Lamlash and Whiting Bay, so have Ayrshires, and so have West Highlanders. The natives were of course the Arran breed—lively, intelligent-looking little creatures, with black skins, small heads, bright eyes, and horns coming clean out of the head. They are still to be found in the northern district of the island, and weigh, when as fat as they can be made on the poor pasture, about 11, 12, and sometimes as high as 14 stones of 24 lbs. each.

The horses in the island generally have greatly improved during the last thirty years, and this improvement has extended to those in possession of the small farmers. Many of them are of the hardy Highland breed—a type of horse well worth preserving, on account of the ease with which he can be kept, and his admirable adaptability to the requirements of a mountainous country;

and the light-legged "gip" horse is in common use where car-hiring is engaged in. The famed breed of trotting-horses known as the "Douglas" breed has been represented in Arran at different times; and, in fact, the old "Douglas horse" himself was in the island for several years, and died at Balnacool about thirty years ago. Some of the present day Arran horses show breeding after these sires, but, strange to say, almost all their produce were affected with "bog spavin," and other diseases of the legs. On the larger farms a greatly improved breed of horses is now kept, but these demand a section to themselves.

The breed of sheep on the smaller farms has also been improved since 1840; and indeed it is questionable whether the tenantry in the Lochranza district have not increased the size of their sheep too much for the bare pasture of that part of the island, because small, hardy sheep will thrive best on bleak hills.

Dr McNaughton blamed the smaller farmers for evading the rotation of crops, and for neglecting liming and draining. Their culpability in this direction still continues. On some of the farms it would be difficult to say what rotation of crops is followed. One field contains patches of pasture, oats, potatoes, turnips, and ryegrass, and the same piece of land is broken almost every year. Wherever there is a better piece than another it will be turned over with the plough; but, in truth, in Whiting Bay and Lochranza the great proportion of the soil will not give a return in its present state for any labour expended on it. At these places there is such a good demand for milk and butter during summer, that the plough is merely put into the land to keep up the semblance of cultivation, and to raise a few potatoes and fodder, and, as it causes much less labour and is more profitable than cultivating, cows are kept, and the fields allowed to lie in pasture.

However willing the smaller tenants might be to improve their farms, little or no inducement is offered for carrying on any effectual operations in the direction of draining and liming, seeing that the holdings are of such limited extent, and they themselves are merely tenants at will. In cases where there are fairly substantial houses attached to the holdings, the rents paid by these tenants average as high as £1 per acre; but in other cases, where the houses are none of the best and there is a stretch of moorland included in the holding, the rents will be as low as 5s. per acre, and in some cases less.

Previous to 1856 the hill around Whiting Bay was set apart as a common for the use of the tenantry, and each was allowed to put a certain number of sheep on it. Sometimes, however when the sheep were counted, it was found that those farmers who had capital had more stock on it than they were entitled to have, whilst the others had their quantity, or less. It was thus

seen that injustice was being done, and in 1856, the late Duke of Hamilton erected a substantial wall between the low ground and the high ground, about 7 or 8 miles in length, and put on a stock of improved blackfaced sheep, and it is now let as a sheep-farm. There are still several of these commons in the north end of the island.

Other improvements suggested by the statistical writers in 1840, were, a road from Lochranza to Sannox, a bridge over Ashdale burn, and a good pier at Brodick, all of which were completed several years ago, but bridges over the rivers of North and South Sannox, and good piers at Lamlash, Blackwater, and Lochranza are still awaiting. There is a pier at Lamlash, but it is only accessible at high water, and the Campbeltown and Glasgow steamers touch at Lochranza, where a ferry-boat meets them every day in summer, and four times a week in winter, but there is no direct communication of any sort between the west side of the island and the mainland. All the produce from that quarter has to be carted over the hills to Brodick, where there is a splendid new pier, from which there is direct communication daily with Glasgow and the west coast during summer, and by the way of Ardrossan four times a week during winter, in addition to a goods steamer, which sails between Glasgow and Arran once a-week all the year round.

The roads throughout the island, although bearing little evidence of thought being expended on their first formation, are kept in excellent repair at the joint expense of landlord and tenants. The smaller tenants are all bound to work six days of nine hours each, annually, and the larger tenants have to pay a certain amount in proportion to their rent, towards the upkeep of the roads. No part of Arran is now without a good road; but some of these roads are very steep, especially those that cross the island from side to side. Literally, almost, the traveller ascends the hills on all-fours, and tumbles down the other side head-foremost. The makers of the roads seemingly followed the line of the sheep-walks, and hence the peculiarly steep nature of many of them.

An old inhabitant may still be met with who remembers when there were few or no roads, and no wheeled carts in Arran; when the ponies were a small diminutive breed—six or seven of them being necessary to draw the wooden plough then in use; and the produce of the soil was carried in “creels” slung on the ponies’ backs. The old inhabitant of Arran can remember many things, amongst others, the time when a man might be seen holding the plough-handles, a woman led the ponies, and a boy or girl drove them. He can also remember when there were no steamers between Glasgow and Arran, and no Glasgow visitors to make a living off!

*Reclamation of Waste Lands.*

Having in the previous pages bestowed some little attention on a general review of agriculture in Arran, with special reference to the condition of the smaller tenants, it is now our duty to enter more fully into detail regarding the various improvements which have been effected within recent years on the larger farms.

Unquestionably great advances have been made in the cultivation of the soil during the past thirty or forty years. This is chiefly to be attributed to the introduction of farmers from the mainland, who have been attracted to the island by the cheapness of the rents, and the wide scope it affords for carrying out improvements. The native farmers eyed these intruders at first with jealousy, and even yet the Highlander affects to despise the Lowlander, though at the same time he attempts to imitate his modes of farming. The late Duke of Hamilton was once conversing with one of his tenants in the Shiskan district. His Grace remarked on the decadence of the Gaelic language in Arran, and inquired the tenant's opinion as to its cause. The sturdy Highlander made answer that it was all owing to the fact, that when a farm was vacant it was generally let to a stranger in preference to a native. Considering the way in which the natives in general appear to have farmed prior to 1840, it is little wonder that a landlord, anxious to improve his estate, should have preferred tenants possessed of the needful capital, and willing to exert themselves to increase the productiveness of the soil, instead of those whose only ambition was to live and die where they and their fathers were born.

Dr M'Naughton tells us that in 1840 improvements were being pushed rapidly forward, and it was about that time that Mr James Allan, now of Clauchlands, and late of Balnacoolie, the late Mr John Spiers, Benecarrigan, and others, commenced to drain and lime waste lands on a somewhat extensive scale.

When Mr Allan, senior, entered Balnacoolie in 1839, it was impossible for a horse to be driven over every part of the farm, on account of the numbers of exhausted peat-bogs lying full of stagnant water. These "bogs" were first filled up with turf, and the surface made somewhat level, after which the fields were drained and limed. On account of the depth of the moss it was found impossible in many places to put down tile-drains, and moss-drains formed with cut turf were laid at first 4 feet deep, and three main drains were laid from 7 to 9 feet deep. These moss-drains ran clear a long time, but the mossy surface has now been wrought off, and the horses' feet when ploughing sink into the drains, consequently tile-drains have been relaid on the sandy subsoil. After being first drained, and until the moss had become firm, these patches were not ploughed, but "delved" with the spade. The land on

Balnacoolie lies very flat, and drains are difficult to keep clear, and in most cases have to be renewed every five or six years. Tile-drains were laid at first from 3 to 4 feet deep, but they required to be often lifted because of their frequently choking with iron ore water washed off the hills. To prevent this as much as possible, a plan was adopted of letting in a run of clear water from the ditches along the higher ends of the fields during summer, and this helped to carry away the foul matter accumulated in the tiles during the heavy rains of winter. Still the cost of lifting and relaying choked drains forms no inconsiderable portion of the expense of farming in Arran.

At the time of draining, all the land on Balnacoolie was limed with Irish shells, from forty to forty-five barrels the imperial acre being put on. The cost of liming new land between 1840 and 1850 was about £4 per acre, including the spreading on the fields. Lime is still used on the same land, but in less quantities, not more than thirty-two or thirty-three barrels per imperial acre being now laid on.

When first brought under cultivation this land raised promising looking crops; there was great bulk of straw, but not the weight of grain one would have expected. Now, however, the ground is firmer, and the yield of both grain and straw is much better. Generally, it may be said that on account of the humidity of the climate the soil of Arran produces greater bulk of straw than weight of grain.

Improvements similar in nature to those described, were effected on the farm of Balmichael, bordering on Balnacoolie; and many years previous, the farm of Sheddock, nearer the shore than Balnacoolie, when in the hands of the proprietor, was greatly improved, and is now and has long been considered the best, as well as the best-cultivated holding in the island.

On the farm of Benecarrigan all the arable land east of the steading, above and below the Lamash road, was broken out of moorland by the late Mr Spiers about twenty or twenty-five years ago. Tile-drains were laid through the fields at a distance of 21 feet apart, and from 3 to 3½ feet deep. The fields being steep there is a sufficient fall, and the leaders did not require to be laid any deeper than the branch drains. The mossy top-soil has now in many cases been wrought off, and when ploughing the drains are not above 6 inches from the hoofs of the horses. On the older arable portion of this farm, many of the drains, when first put in, were laid in the furrows between the gathered rigs, and not deeper than 18 inches, and consequently, where the soil of these rigs has been levelled down through ploughing, the drains are found very near the surface.

The farm of Clachlands, situated at the eastern entrance to Lamash Bay, and extending westwards past the Brodick road,

and north by the hill-tops forming the watershed between Brodick and Lamash districts, is another portion of Arran on which much waste land has been reclaimed and pasture now exists where once heather and stones held undisputed sway. When the farm was taken by Mr Allan, senior, of Balnacool, in 1865, the arable land consisted of about 126 acres; now it forms 260 acres. More land has been reclaimed from a wild state than arable land consisted of in 1865. One of the greatest difficulties the energetic tenant had to contend against, was the number of boulders found about 6 or 9 inches under the surface, which impeded the path of the plough when first going through the land. These boulders are very common, and the soil interspersed with them is peculiar to Arran. Going over the moor roads one sees, in places where a deep cutting has been made to form the road, about 9 inches of good red earth or moss, resting on a basis of large stones and gravel. In Claulands much of the soil is light and friable, and rests on a freestone formation, with the exception that to the east of the steading and near the point the formation is whinstone boulders. The farm has been all drained, wherever it required it, at a uniform depth of 3 feet, although in some places, where a tough subsoil of red till was encountered, it was found almost impossible to go down any depth, and in other places the rock had to be quarried to admit of the drains being put in at all. The whole farm was limed once, and some parts of it have received a second coat; the quantity applied being the same as at Balnacool. The first ploughing at Claulands was done with the single furrow plough drawn by a pair of horses.—One fur being turned over coming down the hill, and the plough being slid up the hill without a fur. After being ploughed the first time the land was allowed to lie uncropped for two years, until the roots in the turf rotted away. From that time it has been wrought on a regular rotation. The reclamation took five years to complete, and the cost per acre was from £10 to £15. Some of the reclaimed land has now lain nine years uncropped, having only been turned over the first time, and it is almost back into its wild state again.

In the autumn of 1869 an arrangement was entered into by the proprietor (the Duke of Hamilton) and the tenant of Glenree farm, according to which over 100 acres of unenclosed rough land on Glenree were to be improved by enclosing, draining, liming, and cultivation—the Duke contributing £700 towards defraying the cost of the work. The greater portion of the land to be improved had been under cultivation previous to 1830, when the land was held by six tenants on the rig-about system. In those days the rigs were always top-gathered, a wide space being left between the ridges into which the stones were thrown, and when reclamation works began, it was all overgrown with heather, bent-grass, or fog. The land was laid off into four fields



## ON THE AGRICULTURE OF

of about 30 acres each, and the work of draining and fencing was at once begun, one field being taken each year. Where the surface was pretty level the drains were put down every 18 feet apart, and from 3 to 3½ feet deep; but where the old furrows were deep, the drains were laid in the furrows 2½ feet deep. Pipe tiles, 2 and 2½ inches diameter, were laid in the branch drains, 4 inch tiles being used in the main drains, which were cut 3 inches deeper than the others. A small proportion of the drains was filled with broken stones; these being plentiful, it was the easiest way to get rid of them. As draining proceeded, the land was ploughed as deep as a two-horse plough could turn a fur over coming down the hill. Two or three men followed each plough and turned out the stones on to the surface, when they were carted away, and employed in building dykes to enclose the fields. So numerous were the stones that few additional needed to be quarried to complete the dykes.

Ploughing and carting off stones was carried on during winter, and about the end of March the land was sown with "sandy" oats.

All the fields got nearly the same treatment, except that which we will call No. 1, which was not so rough and stony as the others. Two crops of oats were taken off, and the ground was then sown down with grass. Lime was applied at the rate of fifty barrels or 5 tons per imperial acre, after the second crop of oats was sown and harrowed in. Two crops of oats were taken off the other three fields, and the third year as much of the land as could be got ready was green-cropped, and the remainder summer-fallowed. Farmyard and bone manures were used in putting down the crop, and during early summer lime was applied at the rate of fifty barrels per acre, and wrought in. The following year the fields were ploughed in ridges 18 feet wide, sown down with oats, grass, and clover seeds, and have been in pasture ever since. The following mixture of grass-seeds was sown per acre:—2 bushels perennial rye-grass; 8 lbs. fescues and meadow grasses; 2 lbs. crested dogstail; 6 lbs. "Timothy"; 4 lbs. white, 2 lbs. alsike, and 2 lbs. perennial red clover; and ½ lb. rib grass. As a rule, the first crop of oats was very poor; the second was good all over. Green crops, on the average, were good, and the sown-out oat crop was excellent.

The following is a summary of the total expenditure incurred in reclaiming this piece of land:—

Draining, including tiles,	£827	11	10
Lime,	323	19	7
Building stone-dykes,	169	7	2
Raising stones, Levelling, &c.,	150	0	0

£1,470 18 7

To the above sum there ought to be added the value of the work of three pairs of horses and four men, but as no exact account was kept of their time, or the yields of the crops, figures as to the profit or loss on the operations cannot be given. However, the tenant is of opinion that the crops over all would pay the cost of keeping the horses, and men's wages, or nearly so. For every sheep carried by this moorland before it was reclaimed, it will now in its pastoral state carry  $2\frac{1}{2}$  sheep.

The most recent works of reclamation in Arran have been executed by the tenant of the Douglas Hotel, Brodick, who farms Corriegills, Strathwillan, Barnhill, and Springbank. About 500,000 tiles have been used in draining, and about a dozen good sized fields have been added to the farms. Sixty or seventy acres have been trenched with the spade. The same difficulty has to be contended against in Brodick as in Balnacool, that is, the great quantity of iron ore water in the subsoil, which chokes the drains, and necessitates their being frequently lifted. Draining costs from 3s. 6d. to 4s. per chain of 24 yards; trenching cannot be done for less than £6 per acre. Labourers well up in draining and trenching cannot be secured in Arran, and squads have to be brought from the mainland, which entails additional expense. The drains are laid from 15 to 16 feet apart, and are made to run so that if possible they may follow the course of the mountain streams. The newly drained land has mostly been limed, and top-dressed with bone and stable manure, of which there is an abundant supply from the heavy stud of cab horses kept for hiring purposes in connection with the hotel. The new land is cropped in rotation with oats, green-crop, and sown-down oats and ryegrass seed, except where it has been trenched, because the trenched land is better to lie for two years before being cropped.

In addition to these somewhat more extensive operations of reclaiming land to which we have now been adverting, other farms have been increased by patches of moorland being brought under cultivation, and the method pursued has in every case been identical with either of those to which reference has been made. Notwithstanding the vigour with which for many years they prosecuted the breaking of new land, the farmers now, it has to be said, have somewhat relaxed their energies, and much that was once reclaimed is again lying wild. Various causes have operated to bring about this result, and amongst these may be mentioned the comparative success of pastoral farming during recent years, which has made it more profitable to feed sheep than to cultivate the soil; the difficulty of securing field-workers during press of work thinning turnips and in harvest-time, the cottars having most of them disappeared, and the other residents being careless of rural labour; and the great difficulty experienced, especially in the

Southend, in getting manure brought into the island—the farm-yard manure being insufficient to green-crop the whole arable land, even with the addition of sea-weed, which is extensively collected and spread on the shore farms. A last and by no means unimportant hindrance to the carrying on of farming on aggressive principles is the amount of damage done to farm produce, especially in the hill districts, by the deer, rabbits, &c., preserved in the island with most anxious care. It would be no benefit—it would be a distinct disadvantage—to the Arran tenant to reclaim waste land now, considering the low price of agricultural produce, the destruction perpetrated by game, and his distance from the markets. On one farm, it has been calculated that the produce forty years ago was one-third an acre more than it is now, labour is so much more expensive; and when the land requires liming a second time, instead of giving it a substantial coat of say fifty barrels per acre, many of the farmers seem to think that they may spare the lime, and yet expect the same productiveness as after the first liming.

#### *Arran Farmers' Society.*

Next to the energy displayed by the Arran farmers in the reclamation of waste lands, and the liming and draining of their holdings, nothing has so much contributed to the advancement of agriculture as the Arran Farmers' Society. As far as can now be ascertained this Society was instituted in 1830, and its objects were the improvement of the breed of cattle, horses, and sheep in the island, by giving prizes, and encouraging the importation of well-bred sires of the different breeds; the advancement of agriculture by the offering of prizes for the best managed green crops, and the holding of an annual ploughing match, at which prizes were offered for the best ploughing, and the newest and most improved ploughs, &c.

The membership in 1860 consisted of 95 persons; at present it numbers 150 individuals. This increase is partly accounted for by the fact, that four or five years ago a separate class was opened at the show, in which prizes are given for Ayrshire cattle and horses, the competition being limited to tenants paying rents of £60 and under. This has induced many of the smaller farmers to join the Society, and, by stimulating a friendly rivalry, will no doubt in the end tend to the improvement of their stocks.

#### *Rotation of Crops.*

Although in 1816 there was established, and still exists, a stated rule of rotation in crops, Arran farmers, small and great, do very much as seems right in their own eyes. An attempt is made to keep up a six-years' shift, that is, two years under pasture; third year, oats; fourth year, green crop; fifth year,

sown-down oats; sixth year, rye-grass and clover; but many of the smaller farmers have little compunction in taking two white crops in succession off one patch, and in leaving bare and ill-conditioned spots untouched by the plough for years. According to the conditions of one of the most recent leases granted by the Duke of Hamilton, the tenant is bound not to take "two white crops in succession without having a green hoed crop between, manured with at least 25 cubic yards of stable manure or other approved manure to each imperial acre, unless by permission from the proprietor or factor." And, after land is laid down to grass, "the tenant shall not break up the same sooner than four years thereafter if a crop of hay be taken, or sooner than three years if no hay be taken." This constitutes a seven years' rotation,\* but the larger farmers do not as a rule follow it, but allow the land to lie in grass for from four to ten years, and in some cases for a longer period.

The crops previously named, with the addition of beans, which are largely grown in the south end of the island, form the principal farm produce of Arran, and for the sake of order, it will be well to take them in their rotation, and treat of each separately

#### *Corn Crops—Oats, Barley, and Beans.*

Oats are very generally sown throughout the length and breadth of Arran. The greater part of the land under white crops is sown with "sandy" oats, but in Shiskan a few acres are under the variety known as "Tam Findlay"; and on Glenree and the new land in Brodick, Swiss oats have been used. These last are about two weeks earlier than the common oats, but they give less bulk of straw and less weight of grain, and do not grind so well as the home seed. Fierce gales sweep the island from side to side during autumn, and "sandy" oats are found to be least shaken by the blast. The best corn growing districts are Shiskan and the Southend. Crops are raised in these places which fairly astonish the stranger by their abundance, and the well-built and neatly-thatched stacks which fill the yards compare very favourably with the miserable-looking thatched houses which form many of the steadings. Indeed, a more pleasing drive could not be taken by any one interested in agriculture, than that round by Shiskan and the Southend of Arran. The soil generally is deep heavy loam, and in some places sharp shingle resting on a subsoil of clay; the fields lie, many of them, very level, and farming is prosecuted with much vigour. Of course some farmers work better than others—there are drones in every hive—but, taken all in all, the medium-sized farms around the Southend of Arran only need good steadings to make

\* This is exceptional, the usual rotation being six course.—*Editor.*

them as desirable holdings as any on the mainland. In the yards ten, twelve, fourteen, and sixteen good solid-looking round stacks are seen, most of them built with a greater circumference, and not so high as those on the mainland,—a formation rendered necessary in order that they may the better withstand the force of the fierce Atlantic gales which rage during winter.

The lea and red land is all sown with oats; occasionally on good heavy soil barley may be substituted, but oats are the more profitable crops. About fifteen years ago the smaller tenants sowed great quantities of barley, but since the increased demand for milk and butter arose, through the influx of Glasgow visitors, barley has entirely been superseded by oats, as the straw of the latter makes much better fodder for the cows than the straw of the former. As this annual migration of Glasgow folks to Arran has in no small measure contributed to the increased comfort of the Arran residents, and has circulated much more money through the island than formerly was the case, it may be interesting here to note, that the arrival of these visitors has been chiefly promoted by the opening of the short route to Glasgow *via* Ardrossan. A steamer, in connection with the Ardrossan and Glasgow, now the Glasgow and South-Western, Railway, was placed on the Arran and Ardrossan station about twenty years ago by a limited liability company, which however came to grief, and the Duke of Hamilton then stepped in, and at his own expense placed the "Lady Mary" on the route, and afterwards the "Heather Bell"; and now for a number of years the steamboat accommodation has been maintained by private enterprise. By this route the journey from Glasgow to Brodick can be accomplished in two and a half hours.

The lea ground is broken by the plough about the beginning of January, and the red land is turned over about the middle of March. Sowing is commenced about the 1st of April, or a week earlier in a good spring. Generally the Arran farmers do not incline to sow early. They have an idea that more fodder is procured by sowing about the 10th or 12th of April, than by sowing at the beginning of the month.

Harvest in an ordinary season begins during the last week of August, except in the extreme north, where it is later. The average yield of oats per imperial acre in 1855 was 25 bushels; over the whole island now the average yield will be about 30 bushels. Some of the larger farms will yield on an average from 32 to 36 bushels; and, in 1880, 40 bushels per acre will be realised on heavy land. The weight per bushel of oats raised on good land will average from about 40 to 42 lbs.; on the smaller farms the average will not be more than 39 lbs. "Hutting" is now very common throughout the island, although thirty years ago such a thing was altogether unknown. Some of the farmers

from the mainland were the first to introduce the practice, and the natives were not slow to follow their example.

In the Southend what little barley is sown is "Chevalier"; on the smaller farms common barley is used. Seed is brought from the Edinburgh market, and the crop weighs about 53 lbs. per bushel.

Bere used to be widely grown in Arran. When Dr M'Naughton wrote his "Statistical Account" in 1840, he tells us that sown-down land was as often cropped with bere as with oats, but this is not the case now. Since thrashing mills became common, people are too lazy to thrash with flails, and bere can only be satisfactorily thrashed with these latter instruments.

Beans are grown, as we have said, in Lagg, and round the south end. They are either sown broadcast or in drills—as often the one way as the other. The crop is cut down by the reaping hook.

The corn stacks on some of the larger farms are well made, and rest on iron stools; on the smaller farms the stacks are thick and short, and flat on the heads. Notwithstanding the apparent want of fall which they possess, these stacks keep very dry, and it is a rare thing for one of them to become "heated."

The great proportion of the grain is ground into meal, but one of the larger farmers, at least, disposes of much of it as seed corn to the smaller farmers. The price received for seed corn averages about 23s. per 6 bushels. In order to keep up the quality of the seed, a quantity of Midlothian oats are sown annually on most of the larger farms, which provides a change of seed for the rest of the island. After being ground, oats, which weigh 40 lbs. per bushel, usually give 140 lbs. of meal in return for a 6 bushel bag of corn. The price of oatmeal in 1879 was 20s. per boll of 140 lbs.; in 1880, it is 15s. Mills are erected for the convenience of the tenantry by the landlord at Lamlash and Sheddog, and all the oats are ground at these places. The tenants are bound to send their oats to be ground in the mill of the district (except seed and horse corn), and they pay the miller at the rate of a peck of meal for every sixteen pecks made, or 1s. per boll of 140 lbs. The prices of meal are fixed by the rates current in Ayr market; the millers being bound not to charge more than 1s. per 140 lbs. above Ayr prices when selling Arran oatmeal; and on the other hand they are bound not to pay the farmers who may have oatmeal to sell, more than 1s. per 140 lbs. under Ayr prices.

As in Bute, so in Arran, the habits of the people have changed much during recent years. About fifteen years ago, all the material sold by the grocer in one of the landward parts of the island was brought over from Brodick in a cart drawn by one horse, whereas now, for the same part of the island, several boat loads of stuff, weighing about 100 tons in all, are brought in during

spring and summer. These stuffs consist of flour, Indian corn, oatmeal, sugar, tea, &c., and as the population in this particular district has in no way increased during the past decade, a great deal less farm produce must inevitably be consumed by the residents. Consequently a greater quantity of the oat crop is now sold as grain than at any former period.

### *Potatoes.*

These roots are not very extensively grown in Arran, except on the deep land on the west side of the island. The early varieties are not so much planted as formerly. The sorts now common in the island are "Walker's Early," "Red Bogs," "Regents," "Dalmahoy's," "Skerry Blues," but chiefly the "Champions," except in the north end, where the "Skerries" still hold their own against all comers. The first to introduce the "Champion" potato was Mr James Allan, junior, Balnacoolie, Shiskan, who in 1877 planted two bags of this seed on his farm, and now the most of the potato-growing portions of the island are covered by them. On good land, in 1879, the yield per acre averaged about 5 or 6 tons; the average yield per acre in 1855 was only 4 tons 7 cwts. The crop of 1880 is the best, both in quantity and quality, which has been grown in Arran since 1847, some plots of "Champions" yielding from 12 to 15 tons per acre.

The crop is lifted by the tenants immediately after harvest is finished, and is pitted. In the spring the potatoes are sold to dealers from Glasgow and Greenock. The price realised for them in 1879 was about £6 per ton, but in 1880 not more than £3 per ton is expected. The pits are of various lengths, and the potatoes in them are covered with heathery turf, over which about 6 inches of earth is placed.

After the failure of the potato crop about twenty-five years ago, the landlord provided the tenants with flax-seed, and an experiment was tried for two years of growing flax instead of potatoes. A mill was erected by the landlord, at Lagg, where the flax was bought by him and dressed for the market. The experiment proved very unprofitable, and was abandoned after two years' trial.

### *Turnips.*

The history of turnip-growing in Arran is very much similar to that in Bute. Wherever there is a plot of ground suitable, this favourite feeding-root is raised. Swedish and yellow, purpletop and greentop, are the varieties sown. On the larger farms about two-thirds of the entire acreage under turnips is sown with swedish, and the remaining third with yellow. The smaller farmers use the same kinds of seed as their neighbours, although they grow more yellow than swedish. In a fairly good year, on the deep land of Southend and Shiskan, the yield of swedish

will be about 20 tons per acre, and of yellow about 16 tons. So far as climate is concerned, there is nothing to hinder the turnip crop to remain in the ground until it is required; and this is what is done on the south-west end of the island, where the attacks of frost are very mild, as is evidenced by the fact that the ground after frost can be ploughed far earlier than on the mainland. In the eastern side of the island, about Lamlash, the yellow turnips are much more easily kept than the other, whether on account of the nature of the soil we cannot say. The whole crop around Lamlash and Brodick districts has to be pulled in the beginning of winter and stored, to prevent the roots being devoured by game, deer being very plentiful in this part of Arran. During the summer months of 1880 one farmer has had to pay a man 21s. a-week for herding the deer off the crop during the night. During the last two years a part of the fields on Clachlands near the steading has been wired off, and a deep pit dug in it, into which the turnips are thrown, and covered over the top with straw. This is found to be a very safe method of storing them. The only objection to it is, that the turnips are apt to grow a little in the spring. Another method followed by some of the farmers is to store the roots in small pits in the fields, containing about a cart-load each, and covered over with a few inches of earth. This plan is found to work admirably. Were it not for the destruction perpetrated by game, storing of turnips would form quite an unnecessary part of the work of the Arran farmer, as the roots might be allowed to lie in the ground all winter.

#### *Rye-Grass and Clover.*

The sown-down land in the island of Arran, in addition to oats or barley, is laid under a crop of rye-grass seed mixed with clover. The soil on the west and south sides of the island raises good hay crops even in a dry season, but, on the east side, it is so thin in many places that the crop is only fit to be eaten by the sheep and cattle when growing. All the smaller farmers allow the rye-grass to ripen, and the seed is sold in Glasgow and Ayr markets. The larger farmers seed as much as is necessary to sow their own land, and some of it they sell to the tenants on the smaller holdings.

Where the soil is heavy clay, and has not been carefully green-cropped, or where the soil is mossy, the seed ripened is not very clean; hair-grass grows amongst it, which, on account of the meagre appliances at their command, the farmers are not able altogether to get clear of. The usual weight of Arran rye-grass seed is about 23 or 24 lbs. per bushel; the price realised this season (1880) is 11s. 6d. per boll of 96 lbs. The average price



per boll is about 10s. Clover seed is sown in the proportion of 5 or 6 lbs. to the imperial acre. In a good season clover grows well on the deep soils of the Southend, but in Lamlash and Brodick districts a good crop is the exception, not the rule.

A good market for winnowed hay is found in Brodick and Lamlash, where the inhabitants keep more cows than their holdings can well carry, and consequently have to buy in fodder for winter feeding. In 1879, hay carted to the purchaser's door was selling at £4, 10s. per ton. One of the farmers in Shiskan supplies the proprietor with the fodder necessary for the maintenance of the stud and deer kept at Brodick Castle, and at the various lodges throughout the island, and this always ensures a ready market for the greater portion of the surplus farm produce. The average weight of winnowed hay produced per Scotch acre of 5 imperial roods, is about 32 or 33 cwts.

For storage of hay the round stack is most in use; the large square stack so well known in some parts of the mainland is rarely met with, but on one or two of the larger farms sheds have recently been put up, which hold as much hay as the ordinary square stack. These sheds can be erected for about 20s. per foot of length; they are open all round, and are covered in by a roof of galvanised iron or felt, supported by wooden posts 12 or 14 feet high. The hay is built up under the roof in a square, the size of the shed, and thus the time and material used in thatching are saved.

Another very common sort of fodder is what is known as "sprints"—long grasses which grow on the moorlands, especially where the soil is somewhat deep and damp, and which are cut and winnowed in the sun like meadow hay, and stacked either in the moors or in the stackyards. The cattle relish this kind of fodder immensely, and in a place like Arran, where fodder is scarce, such hay forms an excellent substitute for rye-grass or straw. Liberty is given by all the farmers to the cottars and very small farmers to cut these "sprints" on the moors, and large quantities are annually winnowed. Pasture in Arran is good during summer, but in winter it becomes foggy.

### *Sheep-Farming.*

As would naturally be expected from the mountainous character of the island, sheep-farming forms no inconsiderable part of the rural economy of Arran. It is interesting to drive up the wild glens which intersect the island, and to compare the varieties of pasturage to be found on what, at a distant view, seem sterile hills, only remarkable because of their rugged grandeur. The pasture on all the hills is not uniform, and much has been done to improve it in one part which has been left un-

done in another. Indeed, sheep-farming in Arran is very much like arable-farming; there are drones in this hive as well as in the other. One man has drained his hills and paid great attention to the breeding of his tups and ewes; another is content to leave things as he found them. There is not the slightest doubt, however, taking the island all over, that the sheep on the hills have been greatly improved within the last twenty-five years. Many energetic young farmers have entered the field, and they have introduced tups from the very best stocks in the mainland, which have effected a marked improvement on the quality of the stocks on the larger farms. The "shot" lambs from these farms are, many of them, sold to the tenants on the smaller farms, and in this way all the stocks in the island have gradually improved. It would be as difficult as it is invidious to single out any one farmer more than another as being the principal agent in effecting the meritorious change in the quality of the sheep, but if success in a showyard be any criterion of the quality of flocks, then the owners of the flocks of Balnacool, Glen Scorrodale, and Glenree, must be awarded the place of honour.

The stocks throughout the island are now, with one exception, blackfaced. As in Bute, Cheviots have been experimented with, but all who had them have now disposed of them except the tenant of Glenree. The larger sheep-farms in the glens carry stocks varying in numbers from 400 to 1800 head each. Generally the flocks are composed of ewes and wethers, but the former are more in number than the latter. The worst of the wether lambs are sold every year, and the best, on mixed stock farms, are kept till they are three years old. The old ewes are sold to farmers on the mainland to be crossed with Leicester tups for the production of cross-bred lambs for the butchers. The tups on the hill farms are bought for the most part in Edinburgh and Ayr, at the autumn ram sales. Tups which have effected the greatest change on the flocks have been bred at Dornel, Knowehead, Overshiels, Westown, and Polquheys. With the exception of those in the north end of the island the sheep are strong healthy animals, large of size, and carrying good fleeces; those in the extreme north are smaller than the others, but they also have greatly improved during recent years. The rams are let out about the 20th of November, and the lambing season extends from the middle of April till near the end of May. The lambs are weaned about the 20th of August, and are then generally dipped; but sometimes they are not dipped until a short time before they are sent to the low lands to graze for the winter, and on a very few farms they are dipped when weaned, and again in March or April. Smearing is now but little practised, dipping with patent compositions having taken its place.

Clipping commences about the middle of June, and is continued till about the first week in July, when the milk ewes have their fleeces taken off. The average weight of clip in 1880 is five fleeces to the stone of 24 lbs., last year (1879) it was  $5\frac{1}{2}$  fleeces; but smearing and dipping have so often been employed alternately, that it is impossible to give a correct average over a period of years. Of course sheep after smearing give a much heavier clip than they give after dipping, but it is proved to be cheaper to dip, because the cost in time and labour smearing, and the lower price of laid wool, more than counterbalances the sum realised for the larger return of wool. The price of white wool at the clipping season in 1879 was 11s., this season (1880) it was 14s. per stone of 24 lbs.

In 1879, the price realised for three-year-old wethers was about 34s. a-head, in 1880, it was 31s. a-head. Average-sized ewes draw from £18 to £20 for the score of twenty-one. In former years it was customary to winter hogs on the mainland, but for the past seventeen years they have invariably been wintered in the south end of the island, and in Shiskan. The period of wintering is from the middle of October till the end of March, and the price charged per head for the season is from 5s. to 6s. The reasons for wintering on the low lands which hold good as regards Bute, apply with equal force in the case of Arran. It is a remarkable fact that both in the north of Bute and the north of Arran, where the formation is granite or slate rock and the subsoil clay, from 10 to 15. per cent. of the hogs die of *brazy* before they are taken off the hills; whereas on the south end of these islands, where the subsoil is over sandstone and whinstone rock, such a thing as death by this disease is comparatively unknown.

The purely sheep-farms up the glens of Shiskan and Scorrodale (which run respectively from Brodick to Shiskan, and from Lam-lash to Lagg), have each a small patch of fine arable land around the steadings. Many of the farm steadings are very commodious and comfortable, new houses having been built within the last twenty-five years on most of the farms, generally at the tenant's expense. These plots are wrought on a regular rotation of crops. The best sheep-farm, though not by any means the largest in the island, is universally admitted to be Glen Scorrodale, between Glenkill and Glenree, on the road from Lam-lash to Lagg, on which great improvements have been made by draining the moorland with sheep-drains, and in selecting choice rams, thereby greatly promoting the quality and condition of the hill stocks.

Married shepherds are usually employed on sheep-farms, and their wages at present average about 15s. 6d. per week, with free house, an allowance of fuel, grazing for one or two cows, and lanfl to plant potatoes. The flocks on the mixed arable and

sheep-farms have come most to the front in shows on the mainland. The stocks on these farms were first improved by tups purchased from Mr John Lorne Stewart of Coll, the late chamberlain on the Argyll estates in Kintyre, by Mr James Allan, senior, then in Balnacoole; and for many years past the tups in use on Balnacoole, Clauchlands, Glenree, Glenkill, and one or two other farms, have been purchased at the autumn ram sales in Edinburgh and Ayr. Balnacoole flock is famed for its ewes and gimmers, and numerous prizes have fallen to its lot at Glasgow and Ayr shows.

The cast lambs from these farms are sold to dealers from Glasgow, Ayr, and Galloway, in the end of summer, and are scattered over the country for grazing purposes. On the arable farms near Lagg in the south end, and some other parts of the island, blackfaced ewes are crossed with Leicester tups, and begin to lamb about the end of March. These ewes are fed during winter, sometimes on turnips, and sometimes with Indian corn. The turnips are carted to them in the fields, as feeding on the netting principle is never practised in Arran. The cross-bred lambs are taken from their dams during summer as they are required by the butchers, and draw from about 18s. to 24s. each; the ewes are sold off, if fat enough, about the end of September, and realise similar prices with the lambs. A new stock is put on in October, and border Leicester tups are bought at the Edinburgh and Hawick sales, in the end of September, for crossing with them. The clip of these ewes formerly, when grease was much in use, weighed about 6 lbs. to the fleece; now, when dipping compositions are used, it will not weigh more than 4 lbs. to the fleece. Some of the farmers keep the cross-bred lambs till they are one and a half year old, and the clip of these hogs averages about 6 lbs. to the fleece, unwashed.

The only other kind of sheep farming to which we need now refer is the experiment with the Cheviots.

This favourite Border breed was first introduced into Arran, by the late Mr Peter Tod, about 1829, and has since then been kept at different times on the farms of Glen Sannox, Glenkill, Auchenhew, and up to the present time (1880) on Glenree. On all of these farms, with the exception of Glenree, they were found not to do well, and have been replaced by the blackfaced. Two hirsels of about 500 breeding ewes each are still kept on Glenree. The climate of Arran is rather moist for Cheviots; and although in a good season they do uncommonly well, yet over a series of years blackfaced would be found to be more profitable. The two objections to the Cheviot ewe are, that in a hard spring she is a bad milker, and she is not so productive as her blackfaced rival. A hirsle of 25 score of Cheviot ewes was kept from 1860 to 1874 on land now carrying a blackfaced flock, and on

an average there was every year 20 per cent. of the Cheviot ewes barren, whereas with the blackfaced there is not more than five per cent. without lambs. In the severe spring of 1879, the Cheviot ewes only gave 60 lambs per 100 ewes, whereas the blackfaced ewes gave 90. On the other hand, it has to be said in favour of the Cheviots that their wool is worth 50 per cent. more in value than that of the blackfaced, although they give a clip of equal weight per sheep. Cheviot draft ewes are worth about 5s. or 6s. a-head more than the blackfaced, and they live equally well. Of late years blackfaced lambs have been selling fully better than the others through so many Cheviot stocks being turned into blackfaced, and a fifth more blackfaced than Cheviots can be carried on the same land.

### *Cattle.*

When the "Statistical Account of Arran" was written forty years ago, there were in the island three distinct breeds of cattle. These were the native breed, the Arran cow; the improved breed, the West Highlander; and the imported breed, the Ayrshire. At that time the Ayrshire was fast coming to the front. The admirable milking qualities of the breed, and their well-known adaptability for large arable farms where a dairy was kept, together with the greater profit to be derived from their sale when fattened than from the native stock, clearly pointed them out as the coming breed. Although, therefore, the West Highlander has been almost completely supplanted by the Ayrshire, it is open to question whether, in the case of the small upland farms, this has been altogether a wise proceeding. Where good dairy cows, as on the large arable farms, are required, Ayrshires certainly pay best, but on some of the higher farms, with poor pasturage, where the breeding of a few cattle for the grazier is of more consequence than dairy produce, the West Highlander would most likely prove more remunerative. Pure bred Ayrshires are not to be found in Arran except on large arable farms. When the breed was first introduced we have not been able to determine, but that a few Ayrshire cows were to be found in the island forty years ago seems certain. The farm of Sheddog has long been noted for its Ayrshire herd, and the former tenant, Mr Neilson, being a native of Renfrewshire, was greatly interested in his dairy stock. His successor, the present tenant, a native of Ayrshire, took over Mr Neilson's stock, and largely increased it. The bulls employed have been imported from herds in the neighbourhood of Dalry and Kilmarnock, and the stock is now one of the finest in the island. Mr Allan, now of Clauchlands, also an Ayrshire man, introduced good cows and bulls from the mainland, and the late Mr Spiers of Benecar-

igan possessed an excellent stock, which has been maintained and improved by his son. On the Douglas hotel farms also there are now splendid stocks of Ayrshire cows, and the breeding of good milk cows generally is being prosecuted throughout the island. On the smaller farms the breed is not yet pure; the cows still show cross-breeding, but were a little care and attention paid to the selection of sires, the Ayrshire breed would soon be the only one found in the lower districts of Arran.

There are three bowing establishments in the island—one at Glenkill, Lamlash, and two near Lagg. The average price paid by the bower per cow is £10 per annum. With the exception of the occupier of the Lamlash dairy, all the other dairymen make cheese, and the smaller farmers invariably make butter, for which there is an extensive demand all over the island in summer.

The price generally realised for cheese, which is sold to merchants in Glasgow, Hamilton, Ardrossan, Kilmarnock, and Ayr, is from 12s. to 13s. per stone of 24 lbs.; butter realises from 1s. 2d. to 1s. 4d. per lb.

The stocks on all the farms are maintained by the quey calves reared on each, and the bull calves are almost all sold as slink veal to the butchers.

The pure West Highland breed of cattle has now become very scarce in Arran. About twenty-five years ago, and prior to that time, on many of the hill farms from 20 to 30 head were grazed during summer, and Monyquill was then noted for its herd. The quality of the cattle has been allowed to degenerate, and Mr Crawford, Drimadoon, and Mr Craig, Dougurie, have it all their own way at the island shows in the matter of prizes.

The native Arran breed are still to be met with in the north end, and the farmer in Sannox regularly purchases the best of the yearlings bred by the north end farmers, which he feeds until they are three years old, when they turn out excellent beef producers. The remainder of the "stirks" are sold annually, at whatever prices they will bring. They are seldom in good condition, the pasturage being very bare. A first cross with an Arran cow and an Ayrshire bull has invariably produced an animal possessing good milking qualities.

The only new breed introduced into Arran of recent years is the Galloway, a number of which are kept by Mr William Tod, of Glenree, who, in 1875, purchased ten well-bred heifers and a bull in the Galloway breeding districts, and now has a herd of between 30 and 40 head. Ten or twelve calves are produced annually; the bull-calves are castrated when a few days old, and the calves are allowed to suckle their dams for seven or eight months. They are not allowed to run loose with their dams but are kept in a shed by themselves and are led morning and evening to

the byre to their dams. When three years old the cattle are sold, and draw from £16 to £18 each off the grass. Galloways in Arran seem to thrive as well as the West Highlanders; they are as easily reared, and when they come to maturity are more valuable.

### *Horses.*

The native horses in Arran were a small stunted breed; seven of them used to be yoked to the wooden plough, and they were ill-kept and ill-trained. When Dr M'Naughton wrote in 1840, attempts were being made to improve the breed. This has been continued ever since with the most gratifying results. The late Duke of Hamilton gave an annual premium of £25 for a number of years prior to his death, for the services of an entire draught horse, which was the means of considerably improving the breed previous to 1860. From 1860 to 1873 there was no premium Clydesdale entire horse in the island, and horse breeding was at a very low ebb. About that time horses began to be very valuable, and some of the members of the Farmers' Society, foremost amongst whom was Mr Hector M'Allister, junior, Glaister, seeing the benefits and profit likely to be derived from breeding good animals, got the Society to move in the matter, and to award premiums whereby owners of Clydesdale stallions were induced to send their horses to the island: the amount of service fee being, at the same time, fixed at a rate within the reach of all. The following is a list of the entire horses, with their stud-book numbers (so far as their pedigrees have been registered), which have secured the Society's premiums since 1873:—in that year "Sir William Wallace" (803); 1874, "Scottish Chief" (763); 1875, "The Chief" (857); 1876, "Lofty" (462); 1877, "Earl of Arran" (263) and "Campbletown Bob" (118) also travelled; 1878, "Marquis" (1215); 1879, "Duke of Connaught" (Dickie's); 1880, "Prince Frederick" (1504).

Young stock have also been purchased in Kintyre for many years back, and their produce has done a good deal to improve the native breed. Horse-breeding is general throughout Arran, and the annual fairs at Brodick in June, and at Lamash in October, offer favourable opportunities for disposing of the foals and surplus stock. The horses generally have improved in quality about 50 per cent. during the past twenty-five or thirty years; these annual fairs are largely attended by dealers from the mainland, and sales are often very brisk. On the smaller farms the mare is kept working all the time she is nursing her foal, but there must be very little for her to do during the summer months. Foals in October sell for about £16 each; in 1865 £7, 10s. was a common enough price. About six years ago prices ranging from £20 to £28 each were in a few instances

realised, and in 1880 at Lamrash Fair the highest figure reported for a single foal was £14. Taking a survey of the island we find that the best and most Clydesdale-looking horses are met with in Shiskan, Lagg, and the south end; but taken as a whole the Arran horses at present may be said to be crosses between a Clydesdale stallion and Highland mares. This type of horse best meets the requirements of the island. Many of the farms are steep, and the roads in general hilly; the light-limbed creature goes quickly over these risings, and is easily fed during winter. No horse suits the farmer so well for certain kinds of work as the old-fashioned, wise, little creature to be found in Arran and other parts of the Highlands, and the breed is worth preserving, both on account of the docility of the animals, their suitableness for light draught purposes, their ready obedience to words, and their neat style of action.

### *Peats.*

Especially in the moorland districts the casting of peats forms, in the early summer, the principal work of the Arran farmer and cottar. Generally the peats are cut in May, and the casting of them is finished by the beginning of June. On being cut they are borne, on barrows made for the purpose, to a position where they will be best exposed to the sun's heat, and spread singly on the bare ground. After lying flat for some time till they are nearly dry, they are "footed," *i.e.*, set up on one end, several together, something after the manner of a stook of corn sheaves, and in good seasons do not require any further handling till they are taken home. With fine weather they should all be stacked a month after they have been cast, and for bringing them home creels made for the purpose are employed, which hold about a half more than the ordinary farm carts. In 1879 few or no peats were got home on account of the wet weather, and coals had to be extensively imported. Peats in a favourable season weigh heavier than in a wet season, as the rain washes all the substance out of them, and, when burned, they neither give out a proper heat nor last any length of time. Short black moss is chiefly cut for peats in Arran. A few peats with fibrous material through them may occasionally be seen, but they are not favourites.

### *Wages and Cost of Farming.*

Wages have increased in Arran during the last twenty-five years in much the same ratio as in Bute. Dairymaids are receiving now (in 1880) from £8 to £12, 10s. per half-year with board, but those engaged at the latter figure must have full charge. Ploughmen's wages are from £12 to £15 per half-year with board; and workers in harvest time,—women, who can with difficulty be procured, receive from 2s. 6d. to 3s. a-day without food, and men



from 3s. 6d. to 4s. a-day, also without food. The wages of these same workers in the turnip-thinning and potato-planting season are from 1s. 3d. to 1s. 6d. a-day. Men are not generally employed at this work, and the wives and families of the cottars are those chiefly engaged in it. Squads of Irishmen are sometimes engaged in Ardrossan and Ayr to come over to Arran and assist in press of work. Although the cottar system is rapidly dying out in the island, on every farm of any size there are still one, two, three, and, in some few cases, more cottars' houses, and the inmates find employment on the farms and in herring fishing. Many of them keep a pig, and each has a drill or two of potatoes, which are planted by the farmer, the cottar supplying the manure, which is principally sea-weed. There are no feeing markets in the island, but the children of the cottars are often engaged privately by the farmers at the rates of wages per half-year which may rule in Ayr market at the time.

Shepherds in most cases are paid salaries of about £40 per annum, with a free house, an allowance for coals or a supply of peats carted, grazing for one or two cows, and a few potatoes planted. Married ploughmen receive 16s. a-week, a free house, an allowance of 1d. worth of milk per day or grazing for a cow, and 2 tons of coals per annum.

The wages of female servants boarded in the house have been doubled within the past twenty-five years, and those of male servants are now about one-half more than they were at the commencement of that period.

#### CONCLUSION.

There are in Arran five villages of a greater or less size, viz.—Lamlash, Brodick, Whiting Bay, Lochranza, and Corrie. Brodick is the most modern-looking of the five, but Lamlash is considered the most important. A branch of one of the Scotch banks is open here daily all the year round, and the village is also the station of a coastguard. A branch bank is opened twice a-week at Brodick, and three times a-week during summer. There are no industries in the island other than farming, and the majority of the inhabitants derive no inconsiderable part of their revenue from the rents they receive for their houses from summer visitors. They are a quiet inoffensive race of people, and many of them live to very old ages. Churches and schools are plentiful throughout the island, and altogether the people have few complaints to make.

## ON THE AGRICULTURE OF FORFAR AND KINCARDINE.

### ON THE AGRICULTURE OF THE COUNTIES OF FORFAR AND KINCARDINE.

By JAMES MACDONALD, Editor of "The Irish Farmers' Gazette."

[*Premium—Thirty Sovereigns.*]

#### INTRODUCTORY.

THE counties of Forfar and Kincardine are bound in by the counties of Perth and Aberdeen and by the Firth of Tay and German Ocean. The former, by far the larger of the two, is separated from Fifeshire on the south by the Firth of Tay; washed on the south-east by the German Ocean; bounded on the north-east by the North Esk; and on the north and north-west by the parishes of Aboyne, Birse, Glenmuick, and Crathie in Aberdeenshire, and by the Grampian Watershed; while Perthshire lies on the west. The most southern point, near Dundee, is in  $56^{\circ} 27'$ , and the most northern, near Mount Keen, in  $56^{\circ} 59'$  N. lat.; the most easterly point, near Montrose, being in  $2^{\circ} 27'$ , and the most westerly, at Blacklunans, in  $3^{\circ} 24'$  W. long. The distance from north to south is about 38 miles, and from east to west 27 miles. The coast-line is about 45 miles long. Forfarshire stands eleventh among Scottish counties as to extent. There are different estimates of the exact acreage. In the Ordnance Survey it is stated at 569,850. Of these, 6486 are taken up by foreshores and 3178 by water. The return of owners of lands and heritages, compiled in 1872-73, gives the "acreage of property" at 553,850 acres.

Kincardineshire is bounded on the south and west by the North Esk and Forfarshire, and on the north by the Dee and Aberdeenshire, and washed on the east for about 35 miles by the German Ocean. It is triangular in form, extending 32 miles from south-west to north-east, and 24 miles where broadest from south to north. Ranking twenty-first among Scotch counties, its area is stated in the Ordnance Survey to be 248,195 acres. The foreshores extend to 1385 and the surface covered by water to 1463 acres. In the return of owners of lands and heritages, the area is stated at 244,585 acres.

According to the return of owners of lands and heritages there are in Forfarshire in all 4898 owners of land, whose property is stated at 553,852 acres, and estimated at £795,581, 7s. of gross annual value. Of these, 971 possess one acre and upwards each, and their total acreage is given at 552,708 acres, or an average of about 569 acres each. The 3927 owners of land under one acre in extent have only 1144 acres amongst them, being less than one-third of an acre each. In Kincardine,

there are 1384 owners of land having amongst them 244,585 acres, and a gross annual rental of £253,392, 12s. The average sizes of the properties is under 179 acres. There are 195 owners of one acre and upwards, the total extent of their estates being 244,396 acres, and their gross annual value £236,021, 17s. These 195 landed proprietors have an average of over 1253 acres each. Among the 1189 owners of lands under one acre in extent, there are only 180 acres, or less than one-sixth of an acre to each.

The assessor's roll for Forfarshire for 1880-81 states the valuation of the county at £649,372, 17s. In 1879-80, the valuation for Kincardine was £259,102, inclusive of £28,464 for railways, &c.

Forfarshire is divided into 55 parishes, but of these six are only partly within it. Edzell extends into Kincardineshire, while pretty large portions of Alyth and Coupar-Angus, and smaller portions of Liff, Kettins, and Airlie, lie in the county of Perth. In Kincardineshire, including Edzell, there are 21 parishes. Each county sends a representative to Parliament, while Dundee has two members, and Montrose with Arbroath, Forfar, Brechin and Bervie, one. Sheriff Courts are held at Dundee and Forfar. The sheriffdom of Kincardineshire is joined with that of Aberdeen, weekly courts being held in Stonehaven.

In Forfarshire there are five royal burghs—Dundee, Arbroath, Montrose, Brechin and Forfar. Dundee, "The Hill or Port of the Tay" was a place of considerable importance as early as the twelfth century. Situated on the left bank of the estuary of the Tay, about 10 miles from where that river falls into the sea, it has a population of about 119,000, including 10,812 in Lochee, which lies within the boundary of the town. It thus in population ranks third in Scotland, and next to Glasgow in trade and manufactures. It is the chief seat in Scotland of the manufacture of coarse linen fabrics and of jute. The more modern parts of the town are well laid off, and it can boast of some fine public buildings, the Steeple, Town House, Albert Institute, the Free Library, &c. It is well provided with public parks. The chief one, the Baxter Park, laid off by Sir Joseph Paxton, and costing in all £50,000, was presented to the town by Sir David Baxter and his two unmarried sisters. The town is historically interesting in many ways. James VI. visited it in 1617; Charles II. in 1651; and Her Majesty the Queen and Prince Consort landed and re-embarked at it in 1844, on their journey to and from Blair-Athole. To commemorate this last event, the Royal Victoria Arch was raised. Dundee has often been the scene of burning and pillage, and down to the middle of the sixteenth century it had walls and gates. Among the eminent men

connected with the town are Sir William Wallace, who, as well as his companion in arms Scrymgeour, is said to have attended school there, and who defended its walls in 1303 against Edward I.,—and Hector Boethius, the first Principal of King's College, Aberdeen.

Arbroath or Aberbrothock is a very old seaport town and royal burgh. It is situated at the mouth of the Brothock, and has a population of 20,169. It possesses a good harbour, and a large trade is carried on in farm produce, and in pavement obtained from 8 or 10 miles inland. There are also extensive tanneries, roperies, breweries, and a shipbuilding yard. The chief object of interest is the Abbey of Arbroath, once one of the richest in Scotland. It was founded by William the Lion, and dedicated to the memory of Thomas à Becket. In 1320 Robert Bruce and his nobles here met, and despatched a nuncio declaring the independence of Scotland. It shared the fate of most of the other abbeys, having been destroyed by the Reformers in 1560. The last of its abbots was Cardinal Beaton. Twelve miles south-east of Arbroath lies the Bell Rock lighthouse, the tradition concerning which is preserved in Southey's well-known ballad.

Montrose, with a population of over 14,000, is a very ancient royal burgh and seaport, with one of the best natural harbours on the east coast. Standing on a level peninsula, it has on one side the sea, on the other the river and basin. Here was established, in 1534, the first school for the study of Greek in Scotland. Among the first of its pupils was the learned Andrew Melville; while David Lindsay, Bishop of Brechin and Edinburgh, who raised the ire of Jenny Geddes, was one of its teachers. In 1848 the Queen and Prince Consort visited Montrose on their way from Balmoral to London. A fine suspension bridge, erected in 1829, connects the island of Rossie with the main body of the town. In the neighbourhood there is a beautifully situated lunatic asylum capable of accommodating 450 patients.

On the South Esk, 8 miles north-west of Montrose, lies Brechin, a town of nearly 8000 inhabitants, and a royal burgh of very ancient date. Like most other Forfarshire towns its staple manufacture is linen, but paper mills, tobacco factories, distilling, brewing, and freestone quarrying, give work to a good many of the inhabitants. The cattle and horse markets of Trinity Muir are held here. Close to the city, on the opposite side of a ravine, stands Brechin Castle, a seat of the Earl of Dalhousie. St Ninian's Cathedral, built in the thirteenth, fourteenth and fifteenth centuries, is now used as a parish church. A round tower, rising to a height of about 100 feet, stands near the church. The only other one of these ancient and

mysterious towers in Scotland is at Abernethy. Among the more famous of the natives of Brechin are Gillies the Grecian historian, and Thomas Guthrie, D.D.

Forfar, the county town, has been a royal burgh since the time of David I. It is situated in the fertile valley of Strathmore, not far from the centre of the county, and has a population of 11,031. Duncan Canmore had a castle here, in which he held his first parliament, but no part of it can now be seen. It is said to have been destroyed by King Robert Bruce in 1307. Linen and jute are the staple manufactures. The County Buildings, and the Reid Hall, presented to the town by Mr Peter Reid of "Forfar Rock" fame, are elegant and substantial edifices.

Of smaller towns and villages there is a large number. The more important of these are Broughty Ferry, Coupar-Angus, and Kirriemuir. Broughty Ferry, or Burgh Tay Ferry, lies on the coast, 4 miles east of Dundee, and includes West Ferry in the parish of Dundee. It is a favourite bathing resort, and has a population of 5817. About a hundred years ago Broughty Ferry consisted of only a few fishermen's huts. Its castle, built in the fifteenth century, was held by the English from 1547 to 1550, and was retaken along with the fort on the hill by the Scottish allied army. Coupar-Angus, a tidy thriving town, stands in the valley of Strathmore, partly in Forfarshire and partly in Perthshire. Its inhabitants, according to the census of 1871, number 2149, and of these 303 reside in the Forfarshire portion. It has linen factories, a tannery, farina works, and saw-mills, and important markets for the sale of farm stock and produce are held at it. The ruins of an abbey, built in 1164 by Malcolm IV., remain in the neighbourhood on the site of a Roman camp. Kirriemuir and Southmuir, with a population of 4000, stand on a slope above the Gairie burn, about 16 miles north of Dundee. They form a burgh of barony, and their linen works employ a large number of people. There is a public school in the town, built in 1835 with £8000 bequeathed for the purpose by John Webster, writer and banker.

Stonehaven is the county town of Kincardine. A burgh of barony and a seaport, with a population of over 3396, it stands on a rocky bay at the mouth of the Carron, and at the extreme northern end of the great valley known as Strathmore. Its principal industries are tanneries, and wool, flour, and meal mills, while herring and white fishing give employment to a large number of its population. Only small vessels can enter the harbour. About  $1\frac{1}{2}$  mile along the coast to the south-west of Stonehaven stands the famous Dunnottar Castle. The ruins of this castle occupy about four acres on the summit of a rock that rises almost perpendicularly out of the sea, and is almost separated from the mainland by a narrow and deep chasm. In

earlier days, considered impregnable, it was stormed in 1297 by Wallace, who is said to have driven the English garrison over the cliffs. It was a place of considerable importance down to the seventeenth century, when it was used for several months as a prison for 167 Covenanters, male and female. The Earls of Marischall, the founders of Marischall College, Aberdeen, resided here. In 1650 Charles II. visited Dunnottar, bringing the Scottish regalia with him for safety. It is stated that Mrs Grainger of Kinneff secretly removed the regalia to the parish church of Kinneff, and thus prevented their falling into the hands of the English, when, in 1652, the garrison of Dunnottar, under Ogilvy of Barras, surrendered to Cromwell's forces. The ruins are in a wonderfully good state of preservation.

Bervie is the only royal burgh in the county. Situated about 10 miles south-west of Stonehaven, at the mouth of the Bervie Water, it has a population of 1013. The first linen yarn mill in Scotland was erected here in 1790. Flax spinning and weaving are its staple manufactures. Hallgreen Castle, an important stronghold of the sixteenth century, stands on an eminence within the burgh. In the year 1800 some vessels were chased to the shore by a French sloop-of-war, which, however, is said to have "taken fright and sailed away on seeing the muster of the volunteers"! Gourdon, a thriving fishing village with a population of 714, is the port of Bervie.

Laurencekirk, the chief town of the Howe, with a population of 1521, lies 10 miles north of Montrose. It may be said to owe its very existence to a gentleman of the eighteenth century—Francis Garden, a Judge of the Court of Session, under the title of Lord Gardenstone, who raised it from a clay-built hamlet with 54 inhabitants to a substantially built burgh of barony. He erected a town hall, an inn, an Episcopal chapel, a library and museum; while he also set up a spinning mill with a bleachfield on the Luther, a tributary of the North Esk, and introduced linen manufactures. Johnshaven, with a population of 1077, is an irregularly built fishing village about 9 miles north-east of Montrose. Its harbour is small, capable of admitting only boats and small coasting vessels. One of the most charmingly situated villages in the north of Scotland is Ban-chory, on the north bank of the river Dee, about 18 miles west of Aberdeen. In 1871 it had a population of 865; but being a favourite summer resort, it has increased considerably since then. In the parish of Nigg, and directly opposite Aberdeen, is the important fishing village of Torry. It has a population of 686, chiefly engaged in fishing. About 5 miles along the coast lies the village of cove, with a population of 450. It is a coastguard station, and has a small natural harbour. The other more important villages are St Cyrus, Auchinblae, and Fettercairn, the

older part of the last being a burgh of barony. The Queen and Prince Consort spent a night in Fettercairn, in September 1861; and an elegant Gothic arch near the hotel where they slept commemorates the royal visit.

The configuration of Forfarshire presents great variety. It combines the wildest of mountain scenery with the softest and most charming of valley landscape. The county forms four natural divisions, the Maritime, Sidlaw, Strathmore, and Grampian sections. The first extends along the coast from Invergowrie to the North Esk, and stretches from 3 to 8 miles backwards. Between Broughty Ferry and Montrose there is a considerable extent of links, unfit for cultivation, and of little value for pasture, but admirably adapted to the royal game of golf and other sports. It contains several tracts of remarkably rich land; is in some parts beautifully wooded and undulating; in others rather flat and tame; while, as it rises towards the Sidlaws, the soil is here and there stiff and cold, or thin and poor, with little shelter. The Sidlaws, a range of trappean hills, almost in line with the Ochils, run through the county from south-west to north-east, terminating a little south of Montrose. The range is very clearly defined, and rises to a height of 1399 feet at Auchterhouse Hill, near the middle of the chain. The other higher peaks are the Gallow Hill, in Glamis, 1242; the Gask 1141, and Kinpurnie 1134 feet. At the pass between Dundee and Newtyle, the ridge sinks to about 1000 feet. The Sidlaw division is true to the general characteristics of trap districts. The higher peaks are partially covered with heather and other coarse herbage, and the slopes green and very uneven. Cultivation has been pushed to a great altitude on both sides, the arable land being continued through the pass between Newtyle and Dundee. The third natural division, Strathmore, or the Great Valley, is, from a purely agricultural point of view, the most important of the four. In reality, Strathmore consists of a belt of Old Red Sandstone that extends from the west end of the Ochils, where it is about 16 miles in width, to Stonehaven, where the width is less than 1 mile. This beautiful plain is about 90 miles in length, and it has been truly said that nowhere else in Scotland is there so extensive a reach of perfectly level fertile soil. The Forfarshire portion of this fine strath is hemmed in by the Sidlaw and Grampian ranges, and displays scenery of great beauty. The valley is well wooded; its farms well laid off and skillfully cultivated, and the soft lowland aspect of its landscape forms a striking contrast to the rugged sterile contour of the heights on the north-west. The Grampian division is by far the most extensive, but the greater part is so mountainous as to be of little value in an agricultural sense. This chain of hills is a continuation of the Grampian

range, and includes, in Forfarshire, about 100 peaks over 1000 feet in altitude. The slopes running down to Strathmore are known as the Braes of Angus, the ancient name of the county of Forfar. These slopes are extensive, very irregular in surface, on the whole moderately fertile, in some parts especially so, and are cultivated high up the hill side. The mountain range is intersected by several large glens, the chief ones being Glenesk, Glenisla, Glen Clova, and Glen Prosen. The scenery in these hilly regions is exceedingly beautiful, particularly in Clova, where the hills are steep and picturesque, and where a large number of rare plants are to be found. The higher peaks are Glasmhaol, which reaches an altitude of 3500 feet, and on which the counties of Forfar, Perth, and Aberdeen meet; Cairnglasha, a little to the north, 3490 feet; Cairnbannoch, and Broadcairn, in Clova, each 3300; Tolmount, also in Clova, 3100; Mount Keen, north of Lochlee, 3077. There are 55 peaks between 2000 and 3000 feet, and 12 over 3000.

The Grampian range and the valley of Strathmore both run into Kincardineshire. The former, indeed, make up about one-third of the entire county. The highest peak here is Mount Battock, on which Forfar, Aberdeen, and Kincardine meet, the altitude being 2555 feet. From this point the range gradually descends, until it terminates at Doonie's Hill, on the coast of Nigg, and 214 feet above sea level. In the Glen of Dye, and along the course of the Feugh, there is a good deal of cultivated land; while the slopes running down to the Dee are not only fertile but beautifully wooded and picturesque. The southern and south-eastern division of the county comprises the Howe of the Mearns (the name given to the part of the valley of Strathmore extending into Kincardineshire), the Hill of Garvock, and the coast from the mouth of the North Esk to about Muchalls. The Garvock Hill, like the Sidlaws in Forfarshire, separates the coast from the central plain, which, though rather less fertile, and not so well wooded as the corresponding portion of the Great Valley in Forfarshire, is nevertheless a moderately rich and very well cultivated stretch of land. Around Fettercairn the scenery partakes a good deal of the soft beauty that characterises the most charming parts of the valley farther south. The land sloping towards the sea is, generally speaking, bare and uneven. The coast is extremely steep and rocky, and dangerous to shipping.

There are a good many lochs in Forfarshire, but they are small. The largest is Lochlee, fed by the streams of Lee and Unich. It is only about  $1\frac{1}{4}$  mile in length, and barely half a mile in breadth. It lies in the extreme north of the county. A little to the south-west (in Clova) are the small lochs of Wharral and Brandy, while still further south lies Lintrothen



Loch, enlarged by the Melgarn being diverted into it for the purpose of forming a larger reservoir for the Dundee Water Works. It now extends to about  $1\frac{1}{2}$  square mile. The loch of Forfar, which was partially drained for its marl, and for the improvement of the surrounding land, lies on the west of the town, and extends to about 1 mile by  $\frac{1}{2}$  mile. The Fithie, Rescobie, and Balgavies Lochs are in this neighbourhood, while in Lundi there are four lochlets, the largest being Longloch,  $\frac{1}{2}$  mile by  $\frac{1}{2}$  mile. Several small lochs, including those of Kinnordy and Logie in Kirriemuir, and Restenet in Forfar, were drained for their skell marl, which was used for agricultural purposes. In Kincardineshire, the lochs are both few and small. The loch of Drum once covered about 300 acres, but has been reduced to less than one-third. The loch of Leys, at one time more than 2 miles in circuit, has been drained. Loirston Loch, 27 acres in extent, lies in the parish of Nigg; and at Fasque there is a beautiful artificial loch, covering about 20 acres.

The chief rivers in Forfarshire are the Isla, the South Esk, and the North Esk. The Isla, rising in the extreme north-west, drains the western districts of the county, and passing into Perthshire near Ruthven, and, after a course of 42 miles, empties itself into the Tay at Cargill. The South Esk has its source in Clova, and flows south-east for the first half of its course, which is about 50 miles in length, and due east the latter. It drains the main portion of the centre of the county, and falls into the sea at Montrose, its mouth forming a large and beautiful basin. Its chief tributaries are the Prosen, the Carity, the Noran, and the Lemno. The Prosen has a course of about 16 miles, and after receiving the burns of Glenlogie, Glenoig, and Lednathy, joins the South Esk below Cortachy Castle. The North Esk or East Water has a course of about 40 miles. It drains the north-eastern division of the county, forms for a long distance the boundary line between Forfar and Kincardine, and falls into the sea about  $3\frac{1}{2}$  miles north of Montrose. On the right, it receives the waters of the Effock, the Keeny, and the Mooran, from which, at a cost of £15,000, a daily supply of 500,000 gallons of water was diverted for the town of Brechin. The Tarf, the Turret, the Meallie, and Auchmull and other streams join the North Esk from the left. The water of Lunan, issuing from Lunan Well, Restenet, and Balgavies, flows in a north-easterly direction for about 17 miles, and empties itself into the beautiful bay of Lunan. The Dighty has a course almost as long, and drains a portion of the eastern slope of the Sidlaws, and falls into the Firth of Tay at Milton. The North and South Esk are excellent salmon streams, while in the smaller waters there is a good supply of trout. In most

of the lochs, too, lovers of the piscatorial art find capital sport. The northern and western slopes of Kincardineshire are drained respectively by the Dee and the North Esk and their tributaries, the interior being drained by the waters of Bervie, Carron, Cowie, Finella, and other smaller streams. The Bervie rises in the parish of Fordoun, and after a course of about 14 miles, falls into the sea a little north of Inverbervie. The Finella, with a course of 7 miles, rises at Garvock, and falls into the sea near Johnshaven. The Carron and the Cowie, each about 9 or 10 miles long, rise respectively in Glenbervie and Wodder Hill, and fall into the German Ocean at Stonehaven. The Luther, rising at the head of the Glen of Drumtochty, is the chief tributary of the North Esk in Kincardineshire; that of the Dee being the Feugh. The latter stream, with a course of 15 miles, rises near Mount Battock, and falls into the Dee at Banchory. The scenery at the junction of the Feugh and the Dee is very beautiful, the Falls of Feugh being greatly admired. The Water of Dye rises at the top of Glendye, and after a course of 10 miles, joins the Feugh a little above the village of Strachan. The Sheeoch water rises on the east of Kerloch, and after a run of about 8 miles, joins the Dee near the Church of Durris.

The counties have long enjoyed the advantages of active communication with the outer world. They can boast of several moderately-sized harbours, and for more than thirty years have had a pretty good railway system. The main line of the Caledonian Railway, which enters Forfarshire at Coupar-Angus, and passes through about the richest parts of both counties, was opened to Aberdeen in 1850. Since then, the local system in Forfarshire has been extending gradually, and is now exceptionally complete. Coupar-Angus and Blairgowrie are united by a branch line of  $4\frac{1}{2}$  miles; Meikle and Alyth by a line of 2 miles; Forfar and Kirriemuir by a line of 6 miles; Bridge of Dun and Brechin by a line of 4 miles; Dubton and Montrose by a line of 3 miles; Guthrie Junction and Dundee by a line of  $24\frac{1}{2}$  miles; Forfar and Dundee by a line of  $21\frac{1}{2}$  miles; and Meikle and Dundee by a line of 18 miles. Coupar-Angus, Meikle, Forfar, Bridge of Dun, Dubton, and Guthrie Junction are all stations on the main line, and thus, it will at once be seen that the leading districts of the county have been brought into wonderfully close connection with the highways of commerce, an advantage not easily overestimated. It is interesting to note that the railway between Meikle and Dundee is one of the oldest in Scotland. Opened in 1831, its original route was by the Balbeuchly and Hatton inclines, worked by stationary engines. It was afterwards altered to easier gradients, making the route longer by 6 miles. From Meikle it runs over the

Sidlaw range by the Pass of Auchterhouse, and winds its way to Dundee *via* Baldragan, Lochee, Camperdown, and Liff. The branch from Guthrie Junction to Dundee passes through Friockheim, Arbroath, East Haven, Carnoustie, Barry, Monifieth, Broughty Ferry, and Dundee. In connection with the North British Railway, steamboats ply between Broughty Ferry and Tayport, and Dundee and Newport. To supersede this somewhat unsatisfactory connecting link, the Company constructed the ill-fated Tay bridge. The length is  $2\frac{1}{2}$  miles, and the number of spans eighty-nine, the centre one being 200 feet wide, and 115 feet high. The cost exceeded £400,000. The bridge, which was constructed of iron, worked well for some time, and was acknowledged by all who saw it in its completeness to be the most wonderful achievement of modern engineering. But, during a terrific hurricane on the memorable night of the 28th December 1879, it gave way under a passenger train, causing the loss of between thirty-five and forty lives. Kincardineshire is not so well supplied with local lines. A branch of  $13\frac{1}{4}$  miles connects Montrose and Bervie, while the Deeside Railway runs through the parishes of Drumoak and Banchory-Ternan.

From an agricultural point of view, Forfar and Kincardine occupy a prominent position among Scottish counties. In the lower districts of Forfarshire, with their genial climate and rich soil, the cultivation of potatoes and wheat is carried to a perfection not excelled in any other part of the country. In Kincardineshire and the higher parts of Forfarshire, less favoured by nature, quite as much skill and care are exercised in the raising of oats and turnips, while in both counties the rearing and feeding of stock are pursued with great success.

In both counties there is a considerable extent under wood, the total value of which is great. In Forfar, there were 26,604 acres under wood in 1854; the increase since then being 1492. The area in Kincardine increased from 16,652 acres in 1854 to 27,843 acres in the present year, being an increase of no less than 11,191 acres. The extent of land in Forfarshire this year, under both grass and fruit trees, was 52 acres; used by market-gardeners for the growth of vegetables and other garden produce, 282 acres; and used by nurserymen, 106 acres. In Kincardine there is no ground under grass and fruit trees, but market-gardeners occupy 20 and nurserymen 12 acres. Both counties are valuable from a sporting point of view, containing as they do many excellent grouse moors and several very good deer forests.

*Population.*

The following table shows the population of the two counties at various times since the beginning of the present century :—

	Forfar.	Kincardine.
1801,	99,053	26,349
1851,	191,264	34,598
1861,	204,425	34,466
1871,	237,528	34,651
Increase in Forfar since 1801,	.	138,475.
„ Kincardine „	.	8,302.

It will thus be seen that the population of Forfar has been more than doubled during the present century. This remarkable increase is due almost wholly to the development of the commercial industries of the county, particularly to the growth of the linen factories. The population in the rural districts has decreased since 1801, while that of Dundee is more than four times as large as it was fifty or sixty years ago. The total increase in Kincardineshire is much less, being under one third; but here, also, there has been a diminution in the rural parts and a large increase in the towns and villages. In regard to population Forfarshire stands fourth, and Kincardineshire twenty-fifth in Scotland. The former has one person for every  $2\frac{2}{3}$  acres; and the latter, one for every 7 acres. The rate in Scotland as a whole is about  $3\frac{1}{2}$  acres to each person. Of the population in Forfarshire in 1871, 106,223 were males and 131,355 females; Kincardineshire had 16,790 males and 17,861 females. In 1871, the inhabited houses in Forfarshire numbered 25,663, or one for every 9 of population; and in Kincardineshire 6661, or nearly equal to one for every 5 persons. The town of Dundee itself claims fully one-half the whole population of Forfar; while about three-fourths reside in the six larger towns, viz.:—Dundee, Arbroath, Montrose, Forfar, Brechin, and Bronghty-Ferry. About one-fifth of the population of Kincardine reside in Stonehaven, Laurencekirk, Johnshaven, and Bervie, these being the only places in the county whose inhabitants number or exceed 1000. The history and antiquities of these counties are very interesting, but these matters lie outside the subject proper of this report.

*Climate.*

Throughout these counties there is great variety in the climate. Within Forfarshire itself it differs very greatly. Along the coast it is mild and dry, the rainfall being under 30 inches, and the mean annual temperature high. The summer heat and

the cold in the winter are less intense than in the interior, while low down by the seaboard snow seldom lies longer than two or three days. On the Sidlaw Hills and the slopes leading up to them the climate of course is colder. The rainfall is greater, and snow often lies to a considerable depth for a pretty long period. In the valley of Strathmore the climate is genial and moderately dry, being well adapted to the cultivation of wheat. Along the Braes of Angus, owing to their close proximity to the Grampian range, the climate is even more rigorous than on the Sidlaws. The winter cold is more severe and the rainfall greater, while these parts are also more subject to heavy falls of snow. Throughout the mountainous region the summer weather is generally warm—sometimes very hot, and for the most part moderately dry. In winter, however, it is stormy in the extreme,—so much so, indeed, that during the dead of the winter sheep-farmers have to withdraw their flocks from the higher glens. The climate of the hilly districts of Kincardine resembles very closely that of the corresponding parts of Forfar; but with regard to the climate of its arable parts, the northern county has not been so highly favoured as the southern. The coast of Kincardine is colder than that of Forfar. The coastline is very rocky and steep, while the land rises rapidly as it recedes. The Garvock Hill rises to a height of 915 feet, and yet its highest peak is little more than  $3\frac{1}{2}$  miles inland. At Bervie and several other points the land reaches a height of about 400 feet within a mile from the sea; while, generally speaking, the elevation one mile inland averages from 180 to 220 feet. The Howe of the Mearns enjoys a more mild and more equable climate than any other part of the county, and yet even there it is not equal to the Howe of Strathmore in Forfarshire. This is due partly to the fact that the Howe of the Mearns lies nearer to the Grampians, that it is farther north, and that it is not so well wooded as the valley farther south. The greater portion of the parishes of Fordoun, Glenbervie, and Fetteresso are rather bare, the climate on the higher and more inland parts of the latter two being cold and late. Snow seldom lies long on the coast or in the Howe of Mearns, but on the Garvock Hill and the higher districts of the interior it often falls in considerable quantities, drifts fiercely, and lies for pretty long periods. The higher parts of Nigg, Banchory-Devenick, Maryculter, and Durriss are similar in regard to climate to the heights of Glenbervie and Fetteresso. The section of Kincardineshire lying on the north side of the Dee, part of the parish of Drumoak and the parish of Banchory-Ternan, is favoured with perhaps the warmest climate of any part of the county. Sheltered from the north by the Hill of Fare, it has a southern exposure, and is well wooded, with a free porous soil. The slopes on the south

side of the Dee are generally steeper and colder, being exposed, excepting in the lower verges, to the full blast of the north winds. The soil in general being of a sandy nature, the land on Deeside frequently suffers considerably from drought in summer, a drawback from which, with this exception, these two counties are comparatively free. The prevailing winds are from the south-west. These winds sometimes sweep along the valley of Strathmore with great violence, there being no eminence sufficient to check them. Coming from a warmer climate, however, they are not as a rule unfavourable to vegetation. Westerly winds, which are not unfrequent, spend upon the Grampians the moisture they absorb in crossing the Atlantic, and thus they are invariably pretty dry before they reach the east coast. The easterly winds are the most damaging, alike to vegetable and animal life. They occasionally sweep the seaboard, especially of Kincardine, with great violence, doing no little damage to crops, and also pressing somewhat hardly on the health of man and beast. A chilly easterly haze, which sometimes sets in in the summer evenings, is also a slight drawback; while in the lower and damper parts of the valley of Strathmore some damage is occasionally sustained from *hoar-frost* or mildew. Notwithstanding these slightly untoward influences, the climate of Forfar and Kincardine is on the whole healthy. Spring sowing of grain generally commences in the earlier parts in the third week of March, and harvesting between the beginning of the third week of August and the 5th of September. In the later districts little is sown till the last week of March or first week of April, and reaping seldom commences before the 1st of September, often not before the second week of September, and sometimes, such as in 1879, even later than that. The mean annual heat of the two counties is stated at 46°—that of summer at 58°; and that of winter, in Forfar at 36°, and in Kincardine at 37°. In Forfarshire rain or snow, it is stated, falls on an average on 195 days, the mean depth in inches being—at Kettins, 33; Monikie, 34; Arbroath, 27; Dundee, 29. In Kincardine rain or snow falls on an average 190 days, the mean depth in inches being reckoned at 32½. At Drum it is 34; Nether Banchory, 30; Fettercairn, 32; and The Burn, 33.

Through the kindness of Mr James Proctor, Barry Village, Forfarshire, we are able to give the following interesting table as to the rainfall, evaporation, and temperature at Barry, from 1870 to 1879, both inclusive.

Barry Village is within about one mile of the sea, and about 35 feet above sea-level.

Year.	Rainfall.	Evaporation.	Mean Temp. °
	inches.	inches.	Degrees of Fahr.
1870	25·60	39·10	46·57
1871	32·28	33·85	46·80
1872	42·98	24·35	48·05
1873	29·47	31·90	46·55
1874	23·76	33·80	47·05
1875	35·55	34·85	47·96
1876	43·10	29·03	48·11
1877	42·76	31·32	46·38
1878	27·59	20·40	47·38
1879	36·62	22·85	44·50
Totals, . . .	339·71	301·45	469·35
Averages for 10 Years, . . }	33·971	30·145	46·935

### *Geology—Soil.*

The main features of the geological formation of these counties may be indicated in a few sentences. The Grampian range is composed mainly of primary rocks. The tops are formed almost wholly of granite, but, descending the southern and eastern slopes, we find the primary rocks associated with small quantities of those belonging to the transition formation, layers of gneiss, mica schist, and quartz being interspersed with small deposits of limestone and clay-slate. A slate vein runs along the hill sides, from a little north of Stonehaven to Easdale, Argyle, and is nearly all the way accompanied by a dyke of trap, or whinstone, which gives value to the soil and beauty and variety to the scenery. The slate comes to the surface at several points, and in some parts, notably in Fearn and Lethnot, it has been quarried. The valley of Strathmore is one long bed of Old Red Sandstone. The Sidlaws, in Forfarshire, and the Garvock Hill, and the other lower hills further north in Kincardineshire, are composed mainly of trappean rocks, with several important deposits of greyish blue sandstone slate, which is of excellent quality for pavement, and which at Carmyllie and elsewhere is quarried extensively for local use and also for exportation. At various points throughout both counties there are deposits of limestone. In Forfarshire it exists in Clova; Glenesk; in some of the Sidlaw valleys; at Hedderwick, near Montrose; and at Bodden in Craig. In Kincardineshire, it is found at Clattering Brig; at Drumtochty and Glenfarquhar in Fordoun; at Whistleberry, Kinneff; at Mathers, St Cyrus; at Kirtonhill, Marykirk; and at Tilwhilly and elsewhere on Deeside. At several of these places the limestone has been extensively worked for many years. At Bodden it

was worked as early as 1696. In both counties there are some deposits of conglomerate, or pudding stone, that on the hill on the farm of West Drums, near Brechin, being considered one of the most perfect in the country. At Dunthill, Marykirk, there is a bed of New Red Sandstone, but there is not enough to give any hopes of there being coal underneath it. At Cowie and elsewhere in Kincardine, and at several points in Forfar, pipe-clay is found. At Montrose, Arbroath, Durris, Fetteresso, and at other places, there are chalybeate or iron ore springs with medicinal properties. Fossil remains of plants and fishes occur in the sandstone; but, as might have been expected, all borings for coal have been unsuccessful, for that valuable substance does not exist under Old Red Sandstone. Throughout the sandstone districts there is a good deal of iron, to which the Red Sandstone owes its colour. About 1710 an iron mine was worked for a short time in Edzell.

With such distinct geological formations, it is only natural to expect that these counties should present considerable variety of soil. The rule that the surface soil corresponds to the rocks beneath holds exceptionally true in Forfar and Kincardine. The extent of alluvial soil—or, in other words, of soil deposited where it now lies by water—is very small indeed, and hence it follows that the great portion of the soil consists of decomposed particles of the underlying rocks, enriched by the decay of vegetable matter, and by a long-sustained system of liberal manuring. It is therefore possible, from the foregoing hurried sketch of the geology of the counties, to form a general idea of the character of the soil in the various districts. In the south-eastern districts of Forfar, those lying between the Sidlaw range and the sea, the soil is, generally speaking, of a light friable nature, well suited for potatoes and turnips. Nearly midway between Dundee and Arbroath there are small portions well adapted to the cultivation of beans; while in the Invergowrie district there is a good deal of very fine grain land, some parts of which, however, are slightly subject to drought. Close by the sea at Monifieth there is a portion of as rich dark brown loam as one could wish to see; while in Panbride, Arbroath, and elsewhere along the coast there is a pretty large extent of similar soil. On some parts of the southern slopes of the Sidlaws, and along as far as the parishes of Monikie and Carmyllie, the sub-soil is hard and retentive; but, as a rule, along the coast it is free and easy, with a small admixture of gravel. On the more inland parts of Carmyllie and in that neighbourhood there is a good deal of thin moorish soil; while along the higher arable parts, on both sides of the Sidlaw range, the soil varies from a very thin “hungry” loam to a pretty fertile loam of moderate depth. As we descend the north-western slopes we find the soil increasing in depth and



quality until, on the banks lying partly on the trap rocks and partly on the Red Sandstone, it becomes very sound heavy reddish loam, well adapted to the cultivation of wheat and potatoes, and rented at from 35s. to 50s. per acre. With the exception of a small stretch of mossy land near the west end of the valley, the soil of Strathmore is, on the whole, true to the character of the formation to which it belongs. On unbroken belts of Old Red Sandstone, the soil is generally a reddish loam of medium texture, very fertile and not difficult to work, with a sub-soil of sand, gravel, or friable clay. This is as near as might be the general character of the soil along the valley of Strathmore; but while the composition does not differ greatly, there are many degrees of depth and value. It is evident that large portions of the lower-lying parts of Strathmore have been scoured by water, for in several of these parts the soil is very thin and gravelly; in a few spots, indeed, so much so that it is scarcely worthy of being cultivated. On the Mains of Glamis and some other farms in the bottom of the valley, the soil is both deep and sound, but, as a rule, the heavier and richer soil lies on the banks and lower parts of the slopes. In the Guthrie and Farnell districts there is great variety of soil. Indeed, there are few farms on which there is not both very rich and very poor land. The most of the land here lies on a clayey subsoil, some of it rather stiff, and resting on the sandstone. Towards Montrose, the soil becomes easier and lighter, but on many farms it is heavy and fertile, being mixed with decomposed trap rocks. In the Howe of Kinnaird there is some very stiff clay, which, in these untoward times, is proving a rather stubborn subject to work. Part of the Howe lies so low that it has been found almost impossible to drain it sufficiently well to admit of its undoubtedly high productive powers being taken full advantage of. It is understood that the re-draining of part of the Howe is being contemplated, and much improvement would certainly result were that carried out. On the rising ground in this neighbourhood the soil is generally a fertile friable loam on a clayey, sandy, or gravelly subsoil. Along the Braes of Angus, which include a large range of country, the soil varies from a thin poor loam, resting on a close red "pan" coming very near to the surface, to good, deep, sound, black loam lying on limestone, trap, sandstone, primary rocks, or a mixture of two or more of these. A friable black loam of medium depth and fertility predominates, the most general subsoil being gravel mixed with clay. Dr Page's graphic description of the configuration of districts adjoining beds of the Old Red Sandstone, applies so truly to the Braes of Angus that we produce it here. He says:—"The hills of Old Red districts, partly composed of traps and partly of soft sandstones and hard conglomerates,

present great diversity of scenery, here rising in rounded heights, there sinking in easy undulations, now swelling in sunny slopes, and, anon, retiring in winding glens or rounded valley-basins of great beauty and fertility." A more correct description of this part of Forfarshire it would be impossible to give.

Along the Kincardineshire coast, from the mouth of the North Esk to Stonehaven, the soil varies from deep rich loam to thin poor black earth or stiff cold clay. A medium loam predominates. In the parishes of Benholm and St Cyrus, there is a good deal of moderately heavy fertile loam, which produces excellent crops. In Bervie, there is also some very good loam, but on almost every farm there is considerable variety, part being free black loam, resting on an open subsoil, part red or brown stiff clay, and part thin and moorish. Similar remarks apply to Kinneff and Dunnottar. On the Garvock Hill the soil is cold, stiff, and sour, heavy to cultivate, and even when well cultivated only moderately fertile. The greater part of the Howe of the Mearns is similar to the main portion of the valley of Strathmore in Forfarshire, the soil being, as a rule, a reddish loam, resting on sand, gravel, or clay. Gravel predominates on the north-western slopes, and clay on the south-eastern. Generally speaking, the soil of the Howe is not quite equal to the Forfarshire part of the Great Valley, but still near Fettercairn, in some parts of Fordoun, and elsewhere, there is some very rich land. Around the village of Fettercairn the soil is deep, strong, rich loam; but in other parts of this parish, and in Edzell, Laurencekirk, and Fordoun, not a little of the land consists of moderate black loam or stiffish clay. Taken as a whole, Fordoun is an excellent agricultural parish, there being in it a large breadth of really good substantial clayey loam. The soil on the best farms in Fordoun and Laurencekirk is a heavy loam, with an admixture of clay. In some seasons it is not very easily reduced to a satisfactory tilth, but when well worked and liberally manured, it yields abundantly, and is rented at from 35s. to 45s. per acre. Along the slopes on the hill sides the soil is thin friable loam. In the parish of Glenbervie there is some good clay loam, but there is also a good deal of thin reddish land that produces only moderate crops. There are some deposits of moss in this parish. In the parish of Fetteresso, near Stonehaven, the soil is mostly sharp friable loam, but in the more inland and higher parts it is an inferior clayey or moorish loam. Throughout the northern half of Kincardine, the soil consists mainly of decomposed granite, with an admixture of moss and other vegetable substances. In the parishes of Banchory-Devenick, Nigg, and Maryculter, the surface is remarkably stoney, large blocks of granite being very numerous on all uncultivated patches. It would seem that the

greater part of the coast-side district between Stonehaven and Aberdeen had at one time been covered with moss. There is a good deal still in the uncultivated parts, though the inhabitants have been carting it away for fuel perhaps for centuries. The soil, too, in the arable parts is impregnated with it, and in this respect the land here differs slightly from that in the Deeside districts of the county, where there is less moss. There the soil is chiefly light, friable, fertile, sandy loam, with subsoil of clay and gravel, or gravel alone. Under liberal farming for a long period, it has become considerably richer than it was originally, and in a year when moisture is plentiful it yields excellent crops of barley, oats, turnips, and potatoes. In the parish of Durriss, back from the river side, there is a good deal of stiff loam lying on a damp clayey subsoil. Exceptionally close drainage has been required here to make the land useful, and although it has, on the whole, been well handled in this respect, it is still of a somewhat damp cold nature. The arable land in Strachan lies along the courses of the Feugh and its tributary the Dye; and in these parts the soil is mostly of a medium loam, friable and fertile in a favourable season, and lying on clayey gravel or on the primary rocks. Away far up on the Feugh side there are some wonderfully rich pieces of land, admirably suited for the raising of barley, oats, and turnips.

*The Progress of the past Twenty-five Years.*

Before tracing the progress of the past twenty-five years (the period over which this report is required to extend), it would have been interesting to have given an account of the ancient systems of farming, and of the social condition of the two counties a century ago. Such an account, however, would take up more space than could well be devoted to a subject not properly within the range of the report. A few sentences must therefore suffice. As might be expected, from its better climate and more southern situation, the lower part of Forfarshire was earlier brought under a system of improved husbandry than Kincardineshire, and thus the contrast between the farming in Forfarshire now and eighty years ago is less striking than between the agriculture of Kincardineshire at the present day and at the commencement of the century. From the Rev. Mr Rodger's Report on Forfarshire, drawn up in 1794, it appears that wheat was then cultivated in every parish in the lower parts of the county; that Angus oats, still famous, had then a wide reputation; that sown grasses were used on almost every farm; that turnips were freely grown; and that potatoes were cultivated with great success, the yield in some instances being as high as from 50 to 60 bolls of 16 stones per acre. The

number of cattle was estimated at 36,499; a small breed, ranging in weight from 16 to 20 stones avoirdupois, occupying the higher grounds, and a larger breed, weighing from 40 to 70 stones, the lower parts. Sheep numbered 53,970, and were mostly of the blackfaced, a few being of the ancient dun or whitefaced kind, and others of mixed breeding. On some of the better managed farms, and around proprietors' residences, there was a good deal of enclosed land mostly under pasture. Farm implements were still primitive, but improvements were fast being introduced. The clumsy old Scotch plough, modernised by metal boards, was still in use, but improved ploughs, chiefly of Small's make, were speedily superseding it. It was not uncommon to see four horses attached to a plough, and oxen were employed on many farms. Ploughmen's wages, without board, averaged about 1s. 3d. per day. There was then a large extent of wood in the county, and early in the present century the area was greatly increased by Lord Airlie, Sir James Carnegie, the Strathmore family, and others. The Rev. Mr Headrick states the number and rental of the farms in 1813 as follows, viz.:—Under £20 of annual rental, 1574; between £20 and £50, 565; between £50 and £100, 682; between £100 and £300, 315; and above £300, 86; making in all 3222 farms.

Agricultural improvement in Kincardineshire would seem to date from about 1760. About that time some important steps of advancement were made by a few enterprising proprietors and farmers, but it was not before the advent of the present century that the spirit of improvement spread throughout the main body of the tenantry. The area of cultivated land about the commencement of the century is stated at 74,377 acres, and that under actual tillage at 45,736, it being estimated that other 28,000 acres were capable of being cultivated. In the better parts of the county, in the Howe of the Mearns, and in the parishes of St Cyrus and Benholm, wheat had been grown as far back as tradition and record stretched; while by 1807, barley, oats, peas, beans, potatoes and turnips, and sown grasses were cultivated with success all over the county. The practice of leaving land in fallow is said to have been introduced into the county by Mr Barclay of Urie in 1761. It spread gradually over the county, and in 1807 the fallow break was estimated at 2619 acres. A pretty regular and well-understood system of rotation was pursued about the commencement of the century. In the wheat districts the older rotation was—1st, fallow and turnips; 2d, part wheat and part barley, usually two-thirds of the former; 3d, beans; 4th, barley; 5th, clover; 6th, pasture; and 7th, oats. Following this came a six-course rotation, of fallow, wheat, beans and turnips in equal proportions, barley, clover, and oats, in order. On thin outlying soils the rotation

was fallow, barley, pasture for two years, and then oats. Mr Barclay for some time pursued with success a rotation of four crops, viz.—1st, wheat, manured after clover; 2d, turnips; 3d, barley; and 4th, clover. In the more hilly parts of the interior the following somewhat peculiar rotation was followed, viz.—1st, oats; 2d, oats, or oats and bere; 3d, turnips, potatoes, and peas; 4th, part oats and part bere; 5th, green crop as before; 6th, part oats and part bere; 7th, clover and rye grass cut for hay; 8th and 9th, pasture. It is stated that potatoes were first planted in Kincardineshire in 1727 by an old soldier who had brought some tubers with him from Ireland to the village of Marykirk, where he resided for only one year. He raised a good crop, and it is recorded that, while the villagers were ready enough to steal the strange plant, “none of them had the ingenuity to cultivate it after he was gone.” They looked in vain to the stems for the seed. Potatoes were again introduced into the Mearns in 1760; while in 1754 turnips were introduced by Mr R. Scott of Dunninald, and grown by him on the farm of Milton of Mathers, St Cyrus. In 1764, Mr William Lyall, farmer in Wattieston, Fordoun, raised about an acre of turnips, and it is stated that the crop was considered so rare that it was sold in small quantities, at one penny per stone, for kitchen vegetables. This crop was cultivated on only a very few farms till 1775, but by the beginning of the present century it was grown all over the county. Sown grasses were not in general use till about 1770; but it is stated that as early as 1730, Sir William Nicolson of Glenbervie, “a spirited cultivator at an early period,” raised hay from sown seeds, “not, however, from the seeds of any of the species of clover now in use, but from such seeds as were found among the natural meadow hay.” The number of cattle in 1807 was 24,825, and it is stated that a four-year-old Mearns ox weighed about 45 stones. The best cattle are described as black or brown, or brindled, with spreading horns. There were also some very good polled cattle, similar to, and no doubt of the same breed as, the Buchan “Humlies,” the progenitors along with the Angus “Doddies” of the improved polled Aberdeen and Angus breed. The sheep stock numbered 24,957, and consisted mainly of blackfaced sheep and the ancient dun faces. Along the coast there were a few Bakewell Leicesters, and also some South Downs. At the commencement of the century the farm implements were somewhat primitive. The ancient Scotch plough was fast giving way to Small’s improved ploughs, which cost about £4 each, and which by 1807 was almost the only sort of plough used in the county. Harrows, with five wooden bills and five iron teeth in each, were coming into use, as also were single carts. During the first ten years of the century about a score of threshing

mills were erected in the county at a cost of from £140 to £180 each. Among the noted early improvers, Mr Barclay is mentioned as having been the most prominent. Between 1760 and 1790 he reclaimed over 900 acres, and planted 1000 acres, raising the rental of his estate of Urie from £200 to £1800 in less than fifty years. Early in the century great improvement was effected in houses, roads, and fences.

Coming to speak of more recent times, we are happy to be able to state that the spirit of improvement aroused in the last century has never been allowed to lie dormant. True, during the last twenty-five years, a smaller extent of land has been reclaimed than during either the last twenty-five years of the eighteenth century or the first twenty-five of the present, but that has not been due to any flagging in the spirit of improvement, but simply to the fact that only a limited area of suitable land remained for the proprietors and tenants of the past twenty-five years to bring under cultivation. There has been less done lately, simply because there has been less to do. No reliable data exist upon which to estimate the extent of land reclaimed in the two counties during the first half of the present century. The Rev. Mr Headrick estimated the arable land in Forfarshire in 1813 at 340,643 acres, but it is clear that that far exceeded the actual extent, for the area at present under all kinds of crops, bere, fallow, and grass, falls short of it by nearly 90,000 acres. The statistics relating to Kincardineshire seem to be rather more accurate. The area under cultivation in 1807 was estimated at 74,377 acres, and from this it would appear that during the first half of the present century about 27,000 acres had been added to the arable extent.

Confining ourselves to the last twenty-five years, we find that in both counties there has been a very substantial increase in the extent of arable land. The agricultural returns, taken up at the outset by the Highland Society and ultimately by the Board of Trade, did not at the commencement include holdings rented at less than £10 a year. It is therefore impossible to ascertain the exact extent of the increase. The following table, however, affords a pretty correct indication:—

	Forfar.	Kincardine.
Arable Area in 1854,	219,721 Acres.	90,161 Acres.
"    "    1870,	238,009 "	116,994 "
"    "    1880,	253,373 "	120,322 "
Increase since 1854,	33,652 "	30,162 "
"    "    1870,	15,364 "	3,328 "

The percentage of the arable area of Forfar under cultivation in 1870 was 41·8; now it is 44·5. In Kincardine, the percentage in 1870 was 47·1; it is now 48·5.

This increase, equal to 1246 acres a year in Forfar and 1117

acres in Kincardine, must be regarded as highly creditable, especially when it is considered that, as previously stated, agricultural improvement in these counties had been carried to a great length long before the period to which the above table refers, so far, indeed, as to leave comparatively little to be done. In Forfar, the main portion of the new land lies in the Braes of Angus along the foot of the Grampians, but there is also a fair proportion on the Sidlaw range. Throughout all the higher lying parts of Kincardine there has been less or more reclamation since 1854. On the slopes of the Garvock Hill there has been a good deal, and also on the hard heights and mossy hollows of Glenbervie and Fetteresso. Along the foot of the Grampians, in Edzell, Fettercairn, Laurencekirk, and Fordoun, there has been a narrow fringe reclaimed within thirty or forty years; a small portion within twenty years; while in each of the parishes in the northern division of the county there has been a certain extent reclaimed. Strachan and Durris claim the larger portion.

The reclamation of land, however, has not constituted the whole of the agricultural improvement in these counties during the last twenty-five years. Indeed, it is doubtful if it has not in outlay been far exceeded by the improvements in farm buildings, draining, fencing, road making, and other accessories which tend to develop the resources of the soil. In both counties there has been a great deal done in the improvement of farm buildings, and these are now on the whole fully abreast of the times. In several parts of Forfar, and also in some parts in Kincardine, re-draining might be carried out with advantage; but still, since 1854, a great improvement has been effected in the condition of the land in this respect. In the wheat and potato districts there is yet a large stretch of open land, but in the parts where the pasturing of live stock holds a prominent place in the economy of the farm, a great extent of fencing, mostly wire and stone dykes, has been erected within the last twenty-five or thirty years. In service or farm roads, too, as well as in the county roads, there has been considerable improvement; while not a little has been done in the way of straightening watercourses, squaring fields, draining small pieces of lake or swamp, clearing the land of stones, and in other small but useful works.

The progress in the cattle department sustained a most serious check by rinderpest in 1865-66. It was several years after that dreadful scourge before the rearing and feeding of cattle were pursued with the same energy as formerly, but within the past ten years a good deal of the lost ground has been made up. The number of cattle in Forfar has decreased since 1854 by 1699 head, and in Kincardine by 202 head. In the character of the stock kept, however, there has been a considerable improvement since 1854. There is no doubt a greater

number of cattle fed than prior to 1854, and it is equally certain that the average weight of beef per head is greater now than twenty-five years ago. Sheep farming has increased greatly in Forfar since 1854, there being a very small decrease in Kincardine. Here also there has been a slight increase in the comparative production of meat, if not likewise of wool.

The valuation roll is perhaps the truest mirror of the development of a county, and in it these counties appear in a most favourable light. The following tables show the valuation of the two counties at various periods since 1674:—

FORFAR.				£	s.	d.
Valuation in 1674	.	.	.	14,287	0	0
" 1856-57	.	.	.	378,148	9	0
" 1872-73	.	.	.	628,956	13	9
" 1880-81	.	.	.	649,372	17	0
Increase since 1674	.	.	.	635,085	17	0
" 1856-57	.	.	.	271,124	8	0
" 1872-73	.	.	.	20,416	3	3

KINCARDINE.				£	s.	d.
Valuation in 1674	.	.	.	6,244	0	0
" 1804	.	.	.	63,748	18	0
" 1855-56	.	.	.	158,761	18	7½
" 1869-70	.	.	.	236,182	6	10
" 1879-80	.	.	.	259,102	0	0
Increase since 1674	.	.	.	252,869	0	0
" 1804	.	.	.	195,353	2	0
" 1855	.	.	.	100,350	1	4½
" 1869	.	.	.	22,919	13	2

The following tables show the valuation of the different parishes in the two counties now and twenty-five years ago, and also the increase in each, thus indicating the parts in which most improvements have been effected within that period.

## FORFAR.

No.	Parish.	1856-57.	1880-81.	Increase.
		£	£	£
1	Aberlemno, . . . .	8,417	10,210	1,793
2	Airlie, . . . .	8,577	11,075	2,498
3	Alyth, . . . .	838	1,296	458
4	Arbirlot, . . . .	6,904	10,895	3,991
5	Arbroath, . . . .	1,054	1,419	465
6	Auchterhouse, . . . .	5,947	8,849	2,902
7	Barry, . . . .	8,031	15,088	7,057
8	Brechin, . . . .	14,238	19,566	5,328
9	Careston, . . . .	2,518	2,697	179



## FORFAR—continued.

No.	Parish.	1856-57.	1880-81.	Increase.
		£	£	£
10	Carmyllie, . . . . .	4,786	7,971	3,185
11	Cortachy and Clova, . . . . .	4,395	7,516	3,121
12	Coupar-Angus, . . . . .	730	1,107	377
13	Craig, . . . . .	9,219	10,828	1,609
14	Dun, . . . . .	6,578	8,003	1,425
15	Dundee, . . . . .	8,123	22,152	14,029
16	Dunnichen, . . . . .	5,912	8,545	2,633
17	Eassie and Nevay, . . . . .	5,923	7,073	1,150
18	Edzell, . . . . .	4,313	6,301	1,988
19	Farnell, . . . . .	5,692	7,379	1,687
20	Fearn, . . . . .	4,155	5,183	1,028
21	Forfar, . . . . .	7,955	12,419	4,464
22	Glamis, . . . . .	11,026	13,921	2,895
23	Glenisla, . . . . .	6,823	12,036	5,213
24	Guthrie, . . . . .	3,464	5,123	1,659
25	Inverarity, . . . . .	6,310	11,891	5,581
26	Inverkeillor, . . . . .	13,594	17,205	3,611
27	Kettins, . . . . .	9,638	12,297	2,659
28	Kingoldrum, . . . . .	4,455	7,175	2,720
29	Kinnell, . . . . .	5,680	7,862	2,182
30	Kinnettles, . . . . .	4,656	6,235	1,579
31	Kirkden, . . . . .	5,629	8,957	3,328
32	Kirriemuir, . . . . .	21,850	31,786	9,936
33	Lethnot, . . . . .	2,716	4,459	1,743
34	Liff and Benvie, . . . . .	11,514	13,824	2,310
35	Lintrathen, . . . . .	4,475	12,720	8,245
36	Lochlee, . . . . .	1,473	4,170	2,697
37	Lunan, . . . . .	2,513	3,051	538
38	Lundie, . . . . .	3,005	4,427	1,422
39	Logie-Pert, . . . . .	6,292	8,862	2,570
40	Mains and Strathmartine	13,982	25,996	12,014
41	Maryton, . . . . .	5,245	6,073	828
42	Menmuir, . . . . .	5,833	8,487	2,654
43	Monifieth, . . . . .	18,332	50,743	32,411
44	Monikie, . . . . .	8,411	18,916	10,505
45	Montrose, . . . . .	5,853	8,755	2,902
46	Murroes, . . . . .	7,143	10,758	3,615
47	Newtyle, . . . . .	5,604	9,082	3,478
48	Oathlaw, . . . . .	3,683	5,649	1,966
49	Panbride, . . . . .	7,698	11,419	3,721
50	Rescobie, . . . . .	6,579	8,759	2,180
51	Ruthven, . . . . .	1,865	2,533	668
52	Stracathro, . . . . .	4,335	6,614	2,279
53	St Vigean, . . . . .	16,691	21,369	4,678
54	Tannadice, . . . . .	11,626	15,612	3,986
55	Tealing, . . . . .	5,825	7,832	2,007
	Total	378,148	590,194	212,046

Percentage of Increase since 1856-57—about 59.

## KINCARDINE.

No.	Parish.	1855-56.	1878-79.	Increase.
		£	£	£
1	Arbuthnott, . . .	7,516	9,916	2,400
2	Banchory-Devenick, . .	8,509	12,007	3,498
3	Banchory-Ternan, . .	9,150	14,409	5,259
4	Benholm, . . .	6,535	8,167	1,632
5	Bervie, . . .	2,036	3,368	1,332
6	Dunnottar, . . .	8,294	11,248	2,954
7	Durris, . . .	6,370	9,902	3,532
8	Drum oak, . . .	705	1,032	327
9	Edzell, . . .	529	666	137
10	Fettercairn, . . .	9,412	12,056	2,644
11	Fetteresso, . . .	21,147	31,264	10,117
12	Fordoun, . . .	15,949	21,307	5,358
13	Garvock, . . .	4,215	7,134	2,919
14	Glenbervie, . . .	5,651	8,397	2,746
15	Kinneff, . . .	6,760	8,751	1,991
16	Laurencekirk, . . .	7,512	12,710	5,198
17	Maryculter, . . .	4,879	6,995	2,116
18	Marykirk, . . .	8,577	11,653	3,076
19	Nigg, . . .	8,559	13,440	4,881
20	St Cyrus, . . .	12,809	18,028	5,219
21	Strachan, . . .	3,637	5,210	1,573
	Total	158,751	227,759	69,008
Percentage of Increase since 1856-57—about 46.				

*Details of Improvements and of Different Systems of Farming.*

Before proceeding to indicate in order the general farming customs, we shall give, in as condensed a form as possible, some notes which we collected regarding improvements and systems of management on different estates and farms throughout both counties. And in giving these, we have to acknowledge our indebtedness to many proprietors, factors, and tenants, for much valuable information. Perhaps the best plan would be to make an imaginary tour through the various districts, bring the reader along, and transcribe our notes as we proceed.

## FORFAR.

Starting, then, where Forfar joins Perth, a few miles west of Dundee, we find ourselves in the parish of Liff and Bervie, which has an area of about 8049 acres, and a rental of £13,824, being an increase of £2310 since 1856-57. The rental in 1683 was £4618 Scots money. Around Invergowrie there is some very fine land rented at from £4 to £5 an acre, this great value being due to the proximity of the land to Dundee. One of the largest farmers in this district is Mr William Smith of Benholm,

who manages his land with much liberality and success. He, along with most of his neighbours, drives a large quantity of city manure from Dundee, and in addition uses a good deal of artificial stimulants. A six-shift rotation is the one most generally pursued, that is—oats, potatoes, wheat, turnips, barley, and one year's grass; all the produce, except what is required to maintain the working staff of the farm, being sold. The cowfeeders of Dundee take all the turnips, hay, and grass they can obtain in their neighbourhood. For some time back they have been paying such high prices for both, more especially turnips, that they have been losing heavily by the transaction, and they are now beginning to deal in these commodities with more moderation. Even yet, however, farmers have no difficulty in obtaining from £16 to £22 per acre for a good crop of turnips, according to the situation of the farm. Coming nearer to Dundee we find still higher-rented land, the best land all around it being rented at from £5 to £6 per acre. The rotation pursued here is also mostly the six courses, with one year's grass and two green crops; but some work without any fixed rotation, cropping to suit the markets and the condition of their land. On the farms close to Dundee few more stock are kept than are required for working the land and supplying the residents with milk, it being found far more profitable to dispose of the turnips and grass to the cowfeeders in the town than to consume these on the farm. This, of course, necessitates very liberal manuring, but from the cowfeeders in Dundee an abundant supply of dung is always to be had. The suburban farmers use city manure very freely. The soil around Dundee is mostly an easy rich loam, in many cases worked into a very high state of fertility. In some parts there is stiff clay, and on some of the higher parts thin loam; but, on the whole, it is more than ordinarily fertile, and is fully taken advantage of. The produce per acre on the suburban farms varies greatly. Generally speaking, it is above the average of the county. One of the best managed farms in the neighbourhood of Dundee is Mid Craigie, occupied by Mr Thomas Drummond. Situated almost in the suburbs of Dundee, it is well laid off, has been highly farmed for a very long period, and is in very rich condition. The soil is heavy loam, well suited for wheat, potatoes, and turnips. An eight-shift rotation is pursued—grass, oats, potatoes, wheat, turnips, oats, potatoes, and wheat with grass seeds. There is thus each year one-fourth of the farm in wheat, one-fourth in oats, one-fourth in potatoes, one-eighth in turnips, and one-eighth in grass. Few stock are kept, all the surplus turnips, hay, grass, and straw going to Dundee. The rent per acre is about £6, payable partly in grain; and the increase since 1850 about 12s. 6d. per acre. The valuation of the landward part of the parish of Dun-

dee increased from £8261 in 1858-59 to £12,079 in 1876-77. Proceeding northwards from Dundee we enter the parish of Mains and Strathmartine, which had a rental of £13,982 in 1856, now increased to no less than £25,996. The valuation in 1683 was £3113 Scots money. The chief estates in this parish are—Baldovan, owned by Sir John Ogilvy, Bart.; Balmuir, belonging to Mr James Webster; and Douglas, the property of the Countess of Home. On each of these there are several large well-managed farms. The principal holding on the latter is the Barns of Claverhouse, which has just passed to the third generation of the Bell family, a family that has for over half-a-century occupied a leading position among Forfarshire farmers. Mr George Bell removed lately to the adjoining farm of Mains of Fintray, leaving in the Barns his only son William, who continues to manage it with all the energy and skill which his father and grandfather so successfully applied to it. Mr George Bell and his father effected great improvement on the farm by draining, road-making, fencing, building, and in other respects, the former having expended no less than £2000 on these improvements during his tenancy. Part of a new steading was erected in 1854, while the remaining portion was renewed in 1874-75, making it one of the most commodious and convenient in the district. The greater part of the farm lies low, by the side of the Dighty Water, and there the soil is a clayey loam of a stiffish tendency. On the rising ground on the north the soil is thin sharp loam. On the Mains of Fintray the soil is stiffer, but under the careful and liberal treatment it receives it yields well. It is rented at about £4, 10s. per acre, gives an average of about 4 quarters of wheat per acre, weighing 62 lbs., and about 5½ quarters of barley and oats, the former weighing 54 lbs. and the latter 40 to 44 lbs. per bushel. On the north-east of Mains and Strathmartine lies the parish of Murroes, which contains some very fine and also some very poor land. Overlooking the valley of the Dighty Water, and commanding a magnificent view of the German Ocean, the coast of Fife, the Firth of Tay, and the suburbs of Dundee, stands the old Castle of Powrie. This hoary ruin adjoins the beautifully situated dwelling-house and steading of the farm of Powrie, occupied by Mr Thomas Smith, whose choice herd of polled cattle and equally well-bred flock of English Leicester sheep, give his farm an interest and importance rivalled by only a few in the county. Of the herd and flock more anon. The steading on Powrie was erected in 1806, when the late Mr Smith, father of the present tenant and a man in many ways in advance of his times, entered the farm. It is in the form of a square, commodious and substantial. Part of this farm also lies down on the Dighty valley, and there the soil is pretty strong loam. The

greater part, however, is on high ground, and, though sharp and sure, is rather wanting in body. Not far away, in the same parish, is the farm of East and West Murroes, leased by Mr David Smith at a rent of £873, 12s. Situated on the Gagie estate, this farm is maintained in very high condition, and produces good crops of potatoes, wheat, barley, oats, and turnips. In drains, stone dykes, and other improvements, Mr Smith has expended over £1600 on the farm, and every year uses a large quantity of city dung and artificial manure. He follows a seven-course rotation, which is by far the most general course in all the wheat and potato districts excepting in the neighbourhood of Dundee, viz. :—oats, potatoes, wheat, turnips, barley, and two years' grass. Mr Smith also holds the fine farm of Grange of Monifieth, which lies nearer the sea, and consists of very rich friable loam. Here he produces beautiful crops of wheat and turnips, and also, as at the Murroes, grazes and feeds a large number of cattle. Mr Smith's father, the late tenant of Leshade in Murroes, was one of the most enterprising farmers in this part of the county. He transformed the farm of Leshade from swamp and moss into one of the best laid out, and most efficiently fenced holdings in the county. The system of drainage which he carried out on the farm is most extensive and unique; and has worked admirably. A great stretch of substantial dykes were also erected at a heavy outlay.

Passing into the parish of Tealing we find ourselves on a higher elevation and in a colder climate. This parish, leading up to the Sidlaws, extends to 7231 acres, and gives a rental of £7832, or £2007 more than in 1856. The rental in 1683 was £1886 Scots. In the lower lying portion of the parish there is a good deal of strong rich land, that yields well when skilfully managed and when the seasons suit. It is a clayey loam with a subsoil of clay and gravel, in some parts rather retentive. In part of the hollows there is also very poor soil, thin, hard, and unproductive, with very stiff subsoil. There are several instances in this parish where the land on the one side of the road is worth 25s. or 30s. an acre, and not worth more than 15s. or 20s. on the other. On the higher lying parts there is also a good deal of variety of soil, but in general it is a moderately fertile loam, resting on a clayey or gravelly subsoil which in some parts is not so open as could be wished. Mr Alexander Bell, Kirkton of Tealing, better known as the late tenant of Balnuth, has been one of the leading farmers in Forfarshire for many years. For a long time he has been extensively employed in the valuation of land and farm crops, and has thus acquired a most extensive and accurate acquaintance with the agriculture of the county. Entering Balnuth when a young man, he at once commenced improvements, and in the course of

his first lease spent a large sum in reclamation, draining, fencing, building, and other works, bringing the farm into high order and convenient form. A good deal of the land is stiff strong clayey loam, not very well suited to potatoes, but of wheat, barley, oats, and turnips he raised excellent crops. A few years ago he transferred Balnuth to his nephew, Mr William Bell, and now resides on the adjoining farm of Kirkton, which he also maintains in high condition. At Kirkton the elevation is over 500 feet, and from a little beyond that the ground rises fast, so that we soon pass beyond the wheat land, and come into the elevation where oats and turnips predominate. In these higher parts the ordinary five or six-shift rotation is pursued, that is turnips, with a small patch of potatoes, barley or oats or part of both, grass for two or three years, and lastly oats. Immediately to the west of Tealing lie the parishes of Auchterhouse and Lundie, in which, as in the higher parts of Tealing, a good deal of land has been reclaimed from moorland within the past thirty years. The soil is for the most part light, sharp loam; and being as a rule well farmed, produces good crops of oats, barley, and turnips. The five and six-shift rotations are also pursued here, and the latter gains ground every year, owing perhaps partly to the greatly increased cost of labour, and partly to the fact that turnips are less subject to "finger and toe" on land worked in six shifts. In these three parishes last referred to, rent ranges from 20s. to 50s. per acre, the main portion being under 28s. A few tenants pay as little as 15s. per acre for the very poorest and coldest of the land. The Earl of Airlie owns the larger portion of the parish of Auchterhouse, one of his lordship's largest farms in this district being East Mains of Bonnyton held by Mr Alexander M'Kay at a rent of £680. In Lundie the Earl of Camperdown is the principal proprietor. On his lands in this parish extensive improvements have been effected since 1850 in the way of reclaiming, draining, fencing, and building, part being done by the proprietor and part by the tenants.

Retracing our steps and proceeding eastwards we pass through the parish of Monikie, in which the Earl of Dalhousie owns a large extent of valuable well-farmed land, and in which a very large sum has been expended on various agricultural improvements during the past twenty-five years. Monikie extends to 9027 acres, and yields a rental of £18,916, or more than £2 per acre. The increase since 1856 amounts to no less than £10,505. The rental in 1683 was £4608 Scots. On the east of Monikie lie the highly cultivated coast-side parishes of Barry, Panbride, and Arbirlot, extending to 6155, 5506, and 6889 acres respectively, and yielding respective rentals of £15,088, £11,419, and £10,895. Barry has increased £7057 since 1856, or more than £1 per acre. A very large part of this increase, however, is due to the

rapid growth of the village of Carnoustie, which has sprung up almost entirely within the last fourteen years. The increase in the other two parishes amounts to over 10s. per acre, the greater part of which is certainly due to the development of the land. The principal property in this neighbourhood is that of Panmure, owned by the Earl of Dalhousie, who is by far the largest proprietor in the county. He owns several estates, situated chiefly in this neighbourhood, around Brechin, and away up through the Grampian range. According to the Return of Owners of Lands and Heritages in 1872-73, the total area of his property measures 136,602 acres, the gross annual value being £55,601, 16s. The Panmure estate is one of the most important. It extends into the parishes of Monifieth, Barry, Monikie, Arbirlot, Carmyllie, St Vigeans, Inverkeillor, and Kinnell, all lying along the east coast. Panmure House, a large palatial mansion, is situated in the upper part of the parish of Panbride, about four miles north-west from Carnoustie. The grounds are both extensive and beautiful, while the gardens, which have a very fine situation, are kept in excellent condition. The policies extend in all to 550 acres. The Home Farm or Mains of Panmure, under the charge of Mr George Cowe, Balhousie, consists of about 200 acres of arable land, worked on the seven-course rotation, with two years grass. A large flock of half-bred ewes and a smaller flock of Border Leicesters are kept on the farm, while a good many cattle are also grazed and fed. A few cows are kept for the supply of milk. Each autumn a lot of two-year-old cattle of the best class that can be obtained are bought in and fed on turnips, straw, and cake. They are generally sold off in spring, and for six weeks before leaving, the allowance of cake is very liberal. The soil on the Panmure estate varies from the richest to the poorest of loam, part lying on a red sandstone subsoil, part on a hard irony pan, part on a moderately open mixture of clay and gravel, and part on porous sand. The poorest land lies in Carmyllie, and the richest a mile or two or more from the sea side. On the greater part of the estate it is very good. On the better soil the seven-shift rotation with wheat, potatoes, and two years grass prevails. A few also work on the six courses. In the higher lying districts and poorer soils the ordinary five or six-shift rotation is pursued, no wheat and few potatoes being grown. Latterly, a good many who formerly worked on the five-shift rotation have turned to the six. The Panmure estate is very judiciously apportioned. It contains a good many large farms, rented at from £500 to close on a £1000; a great many medium sized farms rented from £100 to £300; and a very large number of crofts or pendicles and small farms rented at from £4 to £60. In the parish of Carmyllie alone there are over fifty pendicles. Twenty

of these are rented below £10 each, the lowest being £4 and the average about £6 or £7. Nine pay between £20 and £40, and the others, on an average, from £14 to £15. Generally speaking these small tenants occupy the poorest land, that on the Carmyllie pendicles being thin "hungry" loam lying close to a hard irony or rocky subsoil. The greater part of it has been reclaimed, mostly within the last thirty years, by the crofters themselves, who have no doubt made the district more productive than larger tenants would have done. They cultivate their land well and raise wonderful crops. They grow oats and turnips for the most part, raising just as many potatoes as are required by the family. The smaller tenants keep one cow each, and the larger ones two or more, the young stock being sold when six, twelve, or eighteen months old. The class of stock raised on these pendicles is far superior to what it was some fifteen or twenty years ago, and now they meet a ready sale among the neighbouring larger farmers at good prices. The more industrious of these crofters seem contented and comfortable. They maintain their little places in the best of order, educate their families well, and in not a few cases store up as much money as in course of time enables them to step into larger and better holdings. One great advantage in having these small tenancies on an estate is that they provide an excellent supply of labour, an advantage which those having the management of the Panmure property have evidently not failed to recognise. Pendicles have been well named nurseries for farm servants. The rent per acre on the Panmure estate varies greatly, according to the soil and situation. The better land on the coast side is rented at from £2 to £3 per acre, while in the poorer inland parts the rent falls to £1, and in some cases even to 10s. There is also great variety in the yield of the different crops. Wheat gives from 4 to 6½ qrs., weighing from 60 to 64 lbs. per bushel; barley from 5 to 6 qrs., weighing from 54 to 56 lbs.; oats from 4½ to 8 or even 9 qrs., weighing from 40 to 45 lbs.; potatoes from 5 to 12 tons; and turnips from 14 to 25 tons. Since 1850 the increase in the rental of the Panmure property has been great. At that time several of the best farms were held at little more than nominal rents by life-renters; all of whom, with one exception, had died prior to 1870. When brought into the market these farms were readily let at greatly increased rents, one bringing more than four times the sum paid by the life-renter. Other influences, however, have helped the increase. Aided by the proprietor, the small tenants in the higher parts have, within the last thirty years, reclaimed over 500 acres from moor and moss. A large sum of money has also been expended on drainage and building throughout the property since about 1860, and, under wise direction, this expenditure has resulted in



substantial improvement. A good deal has likewise been done in road making near Panmure House, while since about 1870 close on 700 acres of wood have been planted. Of these 200 acres were planted about ten years ago; and form an addition to the Mansion House policies, the greater part of which has recently been thoroughly drained. These 200 acres were fenced with a high stone wall.

Balhousie, tenanted by Mr George Cowe, is one of the best managed farms on the Panmure estate. A large part of it has been drained by himself; while it is cultivated and manured to the very highest degree, producing abundant crops of all kinds. A choice small flock of Border Leicesters is kept on the farm, while a number of two-year-old cross cattle are bought in in autumn and fed during winter. One of the largest and one of the best farms along the east coast of the county is Pitskelly, leased by Mr F. Dickson at a rent of £1100. The soil is mostly strong sound loam, not so stiff as some land on other farms in the neighbourhood. Panlathie Mill, in the parish of Arbirlot, is also very carefully and skilfully managed by its enterprising tenant, Mr James Duncan. The soil, mostly black friable loam, is worked in the six shift rotation. Wheat yields from 4 to 5 qrs., and weighs from 59 to 64 lbs.; barley 5 to 6 qrs., weighing from 49 to 55 lbs.; oats 6 to 7 qrs., weighing from 40 to 47 lbs.; potatoes 6 to 7 tons; turnips 14 to 18 tons; and hay from 1½ to 2½ tons per acre. Potatoes receive nearly all the manure that can be made in covered courts, the litter grown on the farm being supplemented by flax dust; and in addition to this 2 or 3 cwt. of artificial manure is allowed to the acre. Turnips are generally manured with artificial stuffs. Mr Duncan has long devoted special attention to the raising of potatoes, in which he has been eminently successful. Latterly, he has been conducting experiments in the producing of new varieties which cannot fail to be of service to the country. Wheat is sown as soon as the potatoes are got out of the ground, generally in November, and sometimes in December. Harvesting of grain extends from the end of August to the middle of October. Turnips are not as a rule stored in large quantities, only as many being kept in store as would supply the stock for a month or six weeks. A number of store cattle, generally Irish stock, are bought in every year, and fed off at various times, on turnips, straw, hay, cake, and meal. A few are fed in the courts in summer on cut grass, cake, &c. With some assistance from the proprietor, for which he pays from 5 to 6½ per cent. interest, Mr Duncan has re drained nearly all his farm, and erected a new dwelling-house, and the greater part of the farm steading. The farm of Inverpeffer, occupied by Mr James Swan, and rented at £645, 10s., lies in a detached portion of the parish of

St. Vigeans, adjoining Panbride, and is also on the Panmure estate. This farm extends to about 420 acres, 300 of which are arable, the remainder being rough pasture on sea-braes. The soil varies a good deal. About 100 acres are good fertile clayey loam, a like extent easier black loam, somewhat liable to damage by drought in dry seasons; and the other 100 acres drifting sand and moorish soil. For fifteen years Mr Swan worked the best land in the seven course rotation, and the poorest in six shifts, three years in grass with only one green crop. The thinner land was for a time tried with two green crops after three years grass, and also after two years in grass; and now the whole farm is worked in seven shifts. In one division of the farm, potatoes are grown after two years old grass, and are followed by wheat, oats, turnips, and barley or oats in succession. This course has been adopted with the view of keeping the land free from weeds, and of preventing the oat crop from lodging, which it invariably did, after two years feeding with cake on the pastures. Wheat yields from 4 to 7 qrs. per acre, weighing from 56 to 63 lbs. per bushel; barley from 4 to 9 qrs., weighing from 47 to 57 lbs.; oats from 6 to 12 qrs., weighing from 40 to 44 lbs.; potatoes from 2 to 10 tons; and turnips from 10 to 30 tons. In a very exceptional season, as many as 40 tons of turnips per acre have been grown on this farm. Mr Swan keeps an excellent stock of cross cows, and from these and well bred shorthorn bulls rears a class of beef cattle not surpassed by any and equalled by few in the county. He also has a few pure bred shorthorn cows. He feeds his crosses from birth onwards, taking care to maintain them in a healthy condition, and constantly adding both to their size and cover of flesh. The cattle are sold to the butcher when two or two and a half years old, and on an average for ten years have realised from £24 to £36 a head. Cotton cake is the chief auxiliary during the greater part of the feeding period, linseed or beans or both being given for a month or six weeks before the cattle are sold. About 180 or 200 blackfaced ewes, obtained from the same glen for fifteen years, are purchased in October, and from these and the best of Clark and Stark tups, a very fine stock of half-bred lambs are raised. The lambs are fed on under-corticated cotton cake till from eleven to thirteen months old, and then disposed of. The average price for ten years has been 58s. a head. Mr Swan has effected great improvement on his farm since his entry in 1860. In buildings, draining, fencing, and road making he has expended in all £3500. For improvements in 1868 he obtained £600 at 7 per cent. interest, and £400 in 1877-78 at 5 per cent. The farm is now well appointed in almost every respect. Each field is supplied with water, while there is a sufficiency of cottage accommodation for the servants.

Along the coast here there are many other farms well worthy of special notice, it would be but repetition, however, to detail the system pursued on many more.

Proceeding northwards along the coast towards the thriving town of Arbroath, we pass a number of large well-managed farms, on which the seven-shift rotation is for the most part pursued. One of the best managed and most widely known farms in the neighbourhood of Arbroath is Mains of Kelly, tenanted by Mr Alexander Bowie, the eminent breeder of polled cattle. Mr Bowie is a distinguished general farmer as well as a cattle breeder. He has conducted many experiments on the growing of grain from thick and thin sowing, and under other circumstances. He uses remarkably little seed (about 2 bushels per imperial acre), and grows beautiful crops of all kinds of grain.

Continuing our northern route, we pass through the parishes of St Vigeans, Inverkeillor, Lunan, Maryton, and Craig, and halt at Montrose. These parishes extend respectively to 13,143, 10,516, 1981, and 3686 acres; and in each there has been a substantial increase in the rental since 1856, though not so much as in some other parishes in the county. The increase in St Vigeans, Inverkeillor, and Craig is equal to about 6s. per acre of the total extent, and in the other two about 1s. less. A leading farmer in Craig states that the soil in his district is mostly black loam on trap, or "scurdy" rock. The cropping is pursued in six and seven shifts. Wheat yields about  $4\frac{1}{2}$  or 5 qrs., weighing 62 lbs. per bushel; barley  $5\frac{1}{2}$  qrs., weighing 54 lbs.; oats 6 to  $6\frac{1}{2}$  qrs., weighing 42 lbs.; potatoes about 6 tons; and turnips from 15 to 24 tons per acre. Potatoes are usually manured with court-made dung, while turnips get dung and from 3 to 5 cwt. of artificial manure per acre. Spring sowing commences about the 18th of March, turnip sowing about the 10th of May, and harvesting about the 1st of September. There is very little difference in the system of farming pursued now and twenty-five years ago. In the system of cropping, the only difference is that no fallow wheat is now grown. Twenty-five years ago most of the farmers in this district bred their own cattle. Now they depend chiefly on Irish stock, which they buy in young, from a year to eighteen months old, at from £7 to £17 a head, and which they feed on turnips and cake or meal. The majority go to the London and Glasgow markets when two or three years old. The greater portion of the land has been redrained since 1850, mainly by money advanced on interest by the proprietors. Farm houses are, as a rule, good, and the supply of water sufficient, but fencing is scarce. Rent ranges on an average from 50s. to 60s. per acre. On the large farms of Gilchorn and Cauldoots, on the Anniston

estate, in the parish of Inverkeillor, and occupied respectively by Mr James Bell and Mr John B. Bell, and on the extensive holdings of East Newton and Rosehill, on the Northesk estate, in the adjoining parish of St Vigean, and held respectively by Mr R. J. Donaldson and George Miln, steam cultivation has been pursued jointly for several years with success.

Reversing our course, we proceed westwards along the valley of Strathmore, first passing through the parishes of Farnell and Kinnell. These parishes have hardly forty farms between them, and yet the former has a rental of £7379, and the latter of £7862. Since 1856, the one has increased by £1687, and the other £2182. The whole of Farnell belongs to the Earl of Southesk, whose estate is one of the most compact and desirable in the county, extending, as it does, to 22,525 acres, and bringing an annual rental of £21,811. Of the fourteen farms in Farnell, four exceed £700 in rental, while two exceed £1000—East and West Carcary, leased by Mr Robert Lyall at £1078, and Fithie, rented by Mr David Mitchell at £1008. Lord Southesk is also the largest proprietor in Kinnell, in which the Earl of Dalhousie, as already mentioned, also owns a large extent of good land. The soil in this district is mostly a clayey loam, in parts rather stiff and in others of a moorish texture. The subsoil is chiefly clay, mixed with gravel, and resting on the Old Red Sandstone. On the higher parts whinstone shoots up here and there to within a few inches of the surface. On the richer land the seven-course rotation is pursued, but on the thinner soils, and where it is not convenient to grow potatoes, the five-shift rotation prevails. By not a few farmers the six-shift is now preferred. Only a small extent of land has been reclaimed in this district since 1850, but draining and building have been carried on largely; while since wire-fencing was introduced a good deal has been done in enclosing land. In the latter respect, however, there is still much to do. The draining has been done chiefly by government money, for which the tenants are usually charged a percentage sufficient to cover the interest on the loan and repay the principal. In some cases proprietors have given money for draining for interest only. There have been few changes of much importance in the system of farming in this district during the last twenty-five years. For some time the practice of letting turnips to be consumed on the land by sheep has been prevalent. It is the opinion of experienced farmers that more profit is derived from the crop in this way than if cattle were brought in and fed upon it. The average rent of the land in this district affords no real criterion of the agricultural value of the different classes of soil, for on almost every farm there is a portion of poor land worth little per acre. The average rental per acre is

thus reduced far below the value of the really good land. Bolshan, occupied by Mr Goodlet, is one of the largest and one of the best managed farms in the county. Situated in the parish of Kinnell, on a slope facing south-west, it extends to 690 acres, of which 670 are under cultivation, the remainder consisting mostly of wood pasture. Mr Goodlet took the farm by public competition, paying a large increase on the former rent, while on the renewal of the lease in 1866 he paid a further advance, making the total increase on the rent since 1847 70 per cent. The soil consists of a clayey loam of a moorish texture on the west, where it adjoins the moorside, and runs into stiffish clay on the south-east. The whole farm lies on a clay bottom, overlying the sandstone formation, with protruding pieces of whinstone on the heights. On 280 acres the seven-course rotation is pursued, and on 330 acres the five-shift, with one green crop and two grasses, while the remaining 60 acres are allowed to lie in pasture, being broken up at intervals and sown down again. Wheat yields on an average 4 qrs., weighing 58 to 62 lbs.; barley 5 qrs.; oats close on 6 qrs.; turnips from 18 to 25 tons; potatoes from 4 to 9 tons; and hay from 200 to 300 stones per acre. Only as much hay is grown as is sufficient to supply the farm horses and sheep, the rest of the young grass being pastured mostly by sheep. The root crops get from twelve to fifteen cart loads of farm-yard manure, and 4 or 5 cwt. of guano and other light manures per acre. Guano has been used latterly on account of Mr Goodlet's having found that his cold-bottomed land was not much benefited by the superphosphates and other artificial compounds which he had tried. For a number of years he has obtained large quantities of Aberdeen city manure for mixing with his farm-yard manure, and from this he has found more benefit than from any quantity of light manures he has ever used. The grass lands in particular, which were formerly poor, have improved very much under this treatment. From 120 to 130 cattle are kept during winter. The majority are bought in, but a few are bred on the farm from cross cows and a well-bred shorthorn bull. The two and three-year-old cattle, which make up three-fourths or more of the lot, are fed on turnips, cakes, and crushed grain, and sold as they become "ripe." The three-year-olds weigh on an average, when sold, from 48 to 54 stones (Dutch), and the two-year-olds from 40 to 44 stones. About 50 young cattle and cows are grazed during summer. In addition to the cattle stock, a large and very good flock of Border Leicester sheep are kept. To these we shall refer again. Since his entry Mr Goodlet has effected great improvement on the farm, not only in the land, but also in the houses and other respects. When he obtained possession the land was run out and full of weeds, and

for a number of years he had to farm the whole in the five-shift rotation. He afterwards for a time pursued the seven-shift system alone, but finding potatoes a risky crop, he adopted the present system in order to reduce the area under potatoes and increase the extent under grass. Since his entry in 1847 he has tile-drained upwards of 200 acres to a depth of from  $2\frac{1}{2}$  to 4 feet. The landlord built a range of covered cattle-courts, repaired and made alterations on the farm-steading, and erected two new cottages to replace old ones. He also put an addition to the dwelling-house, and built other two cottages, for the outlay on which Mr Goodlet paid interest at the rate of 3 per cent., performing all the carriages over and above. Eight married ploughmen reside in cottages, and five unmarried men in a "bothy," in which there is a separate bed-closet for each, and a sitting room, and scullery or pantry for general use. The "bothy" is cleaned out daily, and the beds made by a woman paid for the purpose. The farm is conveniently laid out in finely shaped fields, well fenced with dykes and hedges, with rows of trees here and there, and is altogether one of the most beautifully situated holdings in the county.

Continuing westwards we pass through the parishes of Guthrie, Kirkden, and Rescobie, and rest in Forfar. These parishes extend respectively to 3824, 5018, 6724, and 8379 acres; and since 1856 the rental of the first two and the last one has increased by about 10s. per acre of the total extent, and that of Rescobie by about 6s. per acre. In each there are several large well-cultivated farms, and a pretty large extent of good soil. The largest holding is the combined farms of East and West Carsebank, held, along with another adjoining farm, by Mr Patrick Fairweather, and rented at £1285. Situated in the parish of Rescobie, this fine farm extends to 650 acres arable and 22 acres under pasture. The soil is dark brown loam, with good "body." During the first twelve years of the lease he had liberty to farm in any rotation wished, provided always that he worked the land in accordance with the rules of good husbandry. During the remainder of the lease he was bound to have the land in the seven-shift rotation. Wheat gave on an average 4 qrs. or a little more per acre, weighing 61 lbs. per bushel; barley  $5\frac{1}{2}$  qrs., weighing 54 lbs.; oats 6 qrs. or a little more, weighing 42 lbs.; Regent and other early varieties of potatoes 6 tons, Champions and other late kinds 8 tons; turnips from 20 to 25 tons; and hay about 2 tons per acre. One half of the turnip break gets twelve loads of dung and a mixture of artificial manure, generally guano, superphosphate, and dissolved bones, to the value of 40s. per acre. The other half receives a mixture of artificial manure to the value of from £3, 5s. to £3, 10s. per acre. Potatoes get twenty loads of dung per acre, and a small quantity

of artificial manure above the dung to start the plants, the value of the doze of light manure being about 25s. or 30s. per acre. Of late years potatoes have sometimes been grown after lea, and in that case no dung is given, a mixture of light manure being left to do the work itself. This mixture usually consists of woollen manure, dissolved bones, superphosphates, guano, and potash, and when given to the value of about £4 per acre invariably produces an excellent crop, generally less damaged by disease than when dung is applied in the ordinary way. Autumn wheat is sown as soon as the potatoes are lifted, commencing about the end of October, and continuing till the first of January when the weather is suitable. Harvest usually commences about the end of August or first of September. A mixed stock of cattle and sheep are kept in this district, a large number being fed off every year. Most of the cattle are bought in at the auction marts at Dundee, Perth, or Forfar. Very few are bred in the district. A good many farmers within the last few years have returned to the old-fashioned mode of cropping, which leaves a greater area under grass, and also lessens the manure bills. There being much variety of land in this district, it is difficult to arrive at a correct estimate of the average rental. It cannot be far wrong, however, to put it at 30s. per acre. Mr Fairweather took his holding ten years ago at a rent of 50s. per acre. It has now been let to a new tenant at 37s. 6d. per acre, the proprietor undertaking to rebuild all the fence-dykes and erect new steadings free of interest, the tenant performing all the carriages. One of the best holdings in the Guthrie district is that of the combined farms of Newton of Guthrie and Drumhead, held by Mr John Ramsay at a rent of £615. They extend to 378 acres, all arable. The soil is free black loam, with clayey subsoil on three-fourths and gravel on the remainder. The better land is worked in the seven-shift rotation, and the poorer fields in the "easy sixes," that is, three years grass, two grain crops, and one green crop. Barley in this district yields from 4½ to 5 qrs. per acre, weighing 54 lbs. per bushel; oats about 6 qrs., weighing 42 lbs.; potatoes from 5 to 7 tons; turnips 20 to 30 tons; and hay about 200 stones of 22 lbs. As a rule potatoes get all or nearly all the farm-yard manure, turnips getting town manure and artificial mixtures, usually guano, superphosphates, and bone meal, to the value of about £3, 10s. per acre. Harvest generally commences in this district about the 20th of August. Mr Ramsay keeps a stock of 70 or 80 cattle. He rears about 20 calves every year, and buys in the remainder at the principal county markets. They are kept mostly on turnips and straw. When potatoes are cheap a few are given to the cattle, while to finish off from 4 to 6 lbs. of linseed cake are allowed per day. Mr. Ramsay has not for a long time made any alteration in the

system of cropping. As is the case in the district generally, the cattle he feeds are larger and finer than twenty-five years ago, while they are also fed off more quickly. He now buys in two-year-olds instead of yearlings as formerly. Since he entered, twenty-eight years ago, he has effected considerable improvement both in the drainage and manurial condition of the land. The rent of land in this district ranges on the average from 25s. to 40s. per acre.

On the west of Forfar lie the Earl of Strathmore's Glamis estates, which form one of the choicest blocks of landed property in the country. Compactly and beautifully situated in the very heart of Strathmore, this property comprises 16,850 acres of arable land, 4000 of natural pasture, and 2000 under wood, making in all 22,850 acres. The gross rental amounts to £25,000, and the average rental of the arable land 27s. per acre. The increase during the past twenty-five years is about 10 per cent. Since about 1860 very extensive improvements have been carried out on this property, involving an outlay of over £43,000 exclusive of from £150 to £180 expended every year on planting for some time back. Between 1862 and 1870 about 200 acres of woodland, mostly near Glamis station, have been reclaimed at a cost of about £15 per acre. The land was drained and trenched by spade, and for two years cropped with potatoes, stimulated by artificial manure, costing about £3 per acre. Both crops did well, and each sold for £15 per acre, thus in two years doubling the cost of reclaiming the land, less the outlay in raising the crops. One crop of grain followed, the land being sown down with grasses, fenced and planted with Scotch fir, larch, oak, spruce, and other varieties. The soil on the lower lying portion of the reclaimed land is thin, sandy loam, but on the slopes it is a good black loam, lying on Red Sandstone. The greater part of the 200 acres was reclaimed by the proprietor himself; about 40 or 50 acres being let free of rent for four years to a contractor who trenched the land, and drained part of it, the proprietor supplying tiles. During the four years he was allowed to crop the land in any way he pleased. Almost every year since 1860 some building, fencing, and draining has been going on on the property. As leases have expired the land has been drained and fenced where necessary, and new houses built, or the old ones repaired, according to their condition. In the course of the next three years the whole of the estate will have been gone over in this way; and, judging from the portion finished, it will by that time be in a condition equalled by few, and, perhaps, surpassed by none in the county. Covered courts are erected on every farm, and the steadings in all other respects made commodious, substantial, and convenient. The dwelling-houses of the tenants are also made large and handsome, while the supply of servants'



cottages is being completed. In the building of new houses alone about £20,000 has been expended since 1860, while between £1200 and £1500 additional has been spent annually on repairs. The outlay on draining in that period has been about £11,000, on fencing £5000, and road-making £2000. It was formerly the custom to charge interest at the rate of 5 per cent. against the tenants for outlay on buildings, but in recent years all buildings have been erected by the proprietor under the conditions upon which the farms are let. The farms on the Glamis property, as a rule, range from 200 to 400 acres in extent, a few being larger and some smaller. There are also sixty-four crofts or pendicles, running from 8 to 15 acres, held from year to year, and rented at about 30s. per acre. The farms are let on lease of nineteen years. An improvement worthy of special notice is the straightening of the course of the Kerbit, which was carried out by Lord Strathmore in 1876-77. The course of this water formerly ran through the farms of Scrogalfield, Mains of Glamis, and West and Mid Ingleston, in a winding and very inconvenient manner. To obviate this a new course was cut through a sandy mound into the Dean, about 300 yards above the old junction of the two waters. The new run is about a mile in length and 40 yards wide, the greatest depth being about 40 feet. The work, which was carried out under the direction of Mr Ralston, factor on the estates, was attended with considerable difficulty, owing to the want of fall and the sandy nature of the ground. It has, however, proved thoroughly successful. It gives a better fall for the drainage of about 200 acres of valuable land, and thus improves the climate of the district. The cost was about £2000. The old run has been filled up, converted into arable land, and added to the adjoining farms, the tenants of which pay interest on the cost of filling up at the rate of 5 per cent. In this way about 10 acres of excellent land have been added to the farm of Mr Arnot, Mains of Glamis, and all the extra rent he pays is about £10 of interest.

Glamis Castle, an ancient and noble mansion, stands not far from the centre of the property in "its world-famed magnificent surroundings." The home farm adjoins and includes part of the policies. It is worked in six shifts, three years grass, oats, turnips, and barley. Lord Strathmore takes great interest in the rearing of the best class of farm stock, alike of horses, cattle, and sheep, and in this respect his home farm has few equals in the country. The stock consists of a stud of Clydesdale horses, a herd of polled cattle, and a flock of Shropshire sheep, each composed of the best available materials, and managed with great skill and success. In this department Mr Ralston is ably assisted by Mr John Stewart, farm overseer. Of the live stock more anon.

The largest farm on the Glamis estate is Mains of Glamis,

which lies on the north and east of the castle, and which is leased by Mr William Arnot at a rent of £1134. Mr Arnot is a skillful, enterprising, and successful farmer; and, perhaps, he holds more arable land than any other tenant in the county. He pays about £3000 of annual rent. At the Mains, which extends to about 600 acres, he keeps an excellent stock of cattle, including a number of good short-horn cows, and every year he feeds off a large number. The beautifully-situated farm of Hatton of Eassie, on the west of the Home Farm, is occupied by Mr William Whyte, who is one of the most extensive arable and sheep farmers in the county, and is also well known as a successful breeder and an accurate judge of farm stock, more particularly of polled cattle. The Hatton is the highest rented farm on the Glamis property, the rate being about 50s. per acre. The soil, however, is very good sound loam, and the farm altogether a very desirable one. Mr Whyte is perhaps most widely known as the tenant of the farm of Spott, north from Kirriemuir, in connection with which he has a large sheep-run. On the opposite side of the line of the Caledonian Railway is situated the fine farm of Cookston, also on the Glamis property, and occupied by Mr George Ballingall. The extent is 560 acres, and the rental £894. In connection with this farm Mr Ballingall holds a sheep-run extending to 1800 acres. The soil on Cookston is mostly a sandy loam, with some moss in one part. After two or three years grass alternate grain and green crops follow, the latter consisting of potatoes and turnips, and the former mostly of barley and oats. The potatoes grown after grass get a liberal supply of artificial manures. In wet seasons the grain crops are liable to lodge, and, in consequence, the yield is sometimes deficient and the grain light. In good dry seasons, however, about 6 qrs. of oats and barley may be obtained per acre, the average being about 5 qrs. Hay yields about 220 stones per acre, turnips about 16 tons, and potatoes 8 to 9 tons. In late wet years the yields are far below these. Barley and oats are sown from the 20th of March onwards, and turnips between the 15th of May and 20th of June. Harvest commenced this year on the 20th of August, and last year (1879) on the 17th of September; the work being completed this year on the 4th September, and last year on the 10th of October. Mr Ballingall is one of the most successful cattle feeders in the county. He buys in a good many cross yearlings and two-year-olds, mostly Irish, and feeds them off during both winter and summer. He also keeps a large stock of sheep, and feeds these on grass, hay, cake, and turnips. Both cattle and sheep get cake or other extra food during summer as well as winter. Additions were made to the farm steading not long ago, but still it is not quite satisfactory

and is not conveniently situated. The tenant has erected a large extent of fencing, mostly wooden erections, which are being supplanted by wire fences as they decay. The steading and fields are supplied with water by force pump and running streams. The rent of land in this neighbourhood ranges from 30s. to 40s. per acre.

Among other very fine farms in the parish of Eassie and Nevay may be mentioned that of Castleton, occupied by Mr John Adam. Situated on Mr Baird's estate of Drum Kilbo, it extends to 450 acres, all arable, and is rented at £825. The soil is a soft sandy loam, and the seven-shift rotation is pursued. On an average, grain in this district will yield about 5½ qrs. per acre; wheat weighing 60 lbs. per bushel, barley 54 lbs., and oats 42 lbs. Potatoes yield about 6½ tons, turnips 22 tons, and hay about 200 stones of 22 lbs. Green crops get about twelve cart loads of dung and about 5 cwt. of dissolved bones and bone meal per acre. A good many cross bred cattle, mostly Irish stock, are brought in and fed in the district. A large number of cross bred and blackfaced sheep, mostly bred in the county, are also bought in and fed. More cattle and sheep are fed now than formerly, but in the system of cropping there has been little or no change for twenty-five years. Mr Adam also holds the farm of Balnakeilly in the parish of Lintrathen, from the Earl of Airlie. It extends to 250 acres arable and 350 of pasture, the rental being £190. The soil consists of black light loam on trap rock, and is worked in five shifts, with two years' grass and one green crop.

In the parish of Inverarity there are some very good farms, one of the best managed being that of Seggieden on the estate of Fotheringham, and tenanted by Mr Thomas M'Laren. It extends to about 235 acres, all arable, and is rented at £500. The soil in this district is mostly a heavy clayey loam, black and free in some parts, and rather stiff in others. A good deal of the land lies on a damp stiff subsoil, and would be much improved by draining and liming. The seven-shift rotation is the most general. Grain crops yield from 5 to 6 qrs. per acre in fairly good years; wheat weighing about 61 lbs. per bushel, barley 53 lbs., and oats 42 lbs. Potatoes average about 4 tons, turnips about 16 tons, and hay 2 tons. Potatoes get a good supply of farm-yard dung, and turnips farm-yard and city dung, supplemented by from 4 to 6 cwt. of artificial manure. The rent of land in this district varies from £1 to £3, the average being about £2 per acre.

The principal property in the parish of Newtyle is Belmont, owned by the Earl of Wharnccliffe. Extending to 8700 acres, this fine property extends into the county of Perth, but the main portion lies in Forfar. The rental amounts to £13,500, or an average of considerably over 30s. per acre. The arable area

extends to 5500, and the woods to 600 acres; the remaining 1600 consisting of natural pasture. Since 1850 about 800 acres have been reclaimed, mostly by trenching, while in the same period about 300 acres have been planted. On other permanent improvements no less than £59,500 has been expended since 1850—£34,200 on buildings, £17,000 on drainage, £7000 on fencing, and £1500 on roads and miscellaneous works. No fixed regulations exist as to improvements, the works being generally carried out by the proprietor at the beginning of leases. The houses are now as a rule in excellent condition, excepting on some of the crofts and in the hamlets. The soil consists partly of clayey loam, partly of friable black loam of excellent quality, partly light free land, and partly moss on a sandy subsoil. The natural pasture is mixed—green grasses and heather, with a good sprinkling of whins—and is all sound and healthy for stock. The leases are of nineteen years duration, and for very many years no tenant who was able and willing to remain has left the estate. The greater portion of the land is worked on the seven or eight-shift rotation, with two green crops and either two or three years grass. Farms range in size from 60 to 960 acres; and besides these, there are about twenty crofts on the property, the extent of which vary from 4 to 20 acres, and the rental from £9 to £50. These crofts are held from year to year, but changes seldom take place. Indeed, there are crofters on this property whose ancestors had been on the same land for several generations. During this year (1880) one tenant died who had paid no fewer than seventy yearly rents. The pasture land carries Cheviot, blackfaced, and cross-bred sheep, while on the arable farms a large stock of cattle are fed, very large quantities of cake being used. On a few farms the breeding of cattle is being pursued pretty extensively, and this system is on the increase. The general system of farming has improved greatly since 1850, large sums of money being expended on lime and manures. In the same parish lies the desirable little estate of Couston, which belongs to Mr Andrew Whitton, factor on the Belmont property. Mr Whitton has expended large sums of money on various permanent improvements, and now his tidy little estate, which he farms himself, is in the best of trim.

The beautifully-situated parish of Kettins, part of which runs into Perthshire, contains several very fine large farms. The principal estate here is that of Hallyburton or Pitcur, which, in February of this year (1880), Mr Menzies, of the Caledonian Distillery, Edinburgh, purchased from the Marquis of Huntly for the sum of £235,000. One of the best managed holdings, not only on this fine estate, but in Scotland, is South Corston and Mid Gask, leased by Mr

David Buttar at a rental of £700. The late Mr Thomas Buttar, then in Baldinny—still held along with Corston—took Corston for his son, the present tenant, in 1851 at a rent of £400. The farm was then in bad condition, and during the earlier part of the lease the whole was redrained, and about 20 acres reclaimed by trenching from patches of whin bush. A large stretch of fencing was also erected, the proprietor, then the late Lord Hallyburton, supplying wood. In 1870 the lease was renewed, arrangements being made for the erection of a new farm steading, threshing mill, and servants' cottages. These buildings were forthwith erected, and cost in all about £2800. The steading is one of the most commodious and convenient in the county—the cattle courts being wholly covered, and very large and well ventilated. The threshing mill is driven by a turbine-wheel, which proves a great convenience in pulping turnips. The dwelling-house is large and handsome, and is surrounded by beautiful gardens and grounds formed by Mr Buttar. The main portion of the house is about a hundred years old, an important addition having been made in 1879 by the proprietor under arrangements entered into in 1878, when the leases of the two farms, Corston and Baldinny, were extended and renewed for nineteen years. The addition to the house cost between £700 and £800 exclusive of the carriages, which were performed by the tenant. The house was at the same time supplied with water by means of hydraulic power. On the farm of Baldinny, which adjoins Corston on the north-east, extensive improvements have been executed, both by the landlord and tenant, within the past twenty-five years. Considerable difficulty was long experienced in getting the lower lying fields thoroughly drained, and to obviate this, Lord Hallyburton in 1878 constructed a large culvert at a cost of about £200. By this means a much better outlet has been obtained, and now the drains work admirably. The proprietor also gave £200 in 1878 to extend and improve the farm steading of Baldinny, besides wood for fencing, the wire being supplied and the fence erected by the tenant. Baldinny was twice drained by the late Mr Thomas Buttar and the present tenant,—first, with stones on wooden soles, and then with tiles. The fields have all been rearranged, old ditches filled up, old hedges uprooted, and many other improvements effected. In all, the present tenant and his father have spent over £4500 on improvements on the two farms. All this is in addition to the large sums spent upon them by the proprietor. They are now in the best of condition, and make a compact desirable holding of 560 arable acres, rented at £1050. The soil consists of varying loam resting on rotten sandstone rock. On some parts the loam is thin but sharp, in others, particularly on the haughs of Baldinny, somewhat clayey. On

some fields the subsoil is of a sandy nature, while here and there on the higher knolls, the whinstone rock, so well displayed on the adjacent hills, shoots up very close to the surface. As a whole, the soil on Baldinny is heavier than on Corston, but the latter is rather more sound and sharp, and better suited for grass and potatoes. Heavier grain is generally grown on the sharp sound land of Corston than on the deeper softer land of Baldinny. Potatoes are also more liable to disease on the soft land. The rotation stipulated for in the lease is that of seven shifts, two years grass, and two green crops; but, latterly, Mr Buttar has been allowing the land to lie in grass for three years. The grass stands up very well. Mr Buttar feeds a great many cattle and sheep, but these will be referred to afterwards.

Directing our course towards the Grampians, we enter the Braes of Angus. We here find a colder climate, greater variety of surface and thinner soil, but withal a beautiful country, occupied by an intelligent and enterprising class of farmers, whose system of management bears no unfavourable comparison to that which has won for the lower and better favoured parts of Forfarshire, the credit of being one of the most advanced agricultural districts in Scotland. The principal property in this region is that owned by the Earl of Airlie, who is well-known as an active supporter of every movement that has for its object the development of the agriculture of the country. The Airlie estates extend over a considerable part of Forfarshire, and also stretch into the county of Perth. The total area measures perhaps about 70,000 acres, the rental for the crop of 1879 being £26,500—£19,500 in Forfarshire and £7000 in Perthshire. The increase in the rental during the last twenty-five years amounts to about £10,000. The arable area is estimated at about 1800 acres, rented on an average at say 24s. 6d. per acre, making a total of £22,050, and the hill pasture at 4500 acres rented at 2s. per acre, or in all £4500. The plantations extend to about 7000 acres. Since 1850 a large extent of land has been reclaimed from moor, and is now bearing profitable crops. Within the same period over 500 acres have been planted at a cost of about £3, 10s. per acre. The proprietor has also expended a large sum of money in building, draining, and fencing. These improvements are effected under agreements entered into at the commencement of leases, all new buildings, considered necessary, being as a rule erected by the proprietor, the tenant performing the carriages. Throughout these estates the tenants have also done a good deal to improve the condition of their farms, in the way of reclaiming small patches, draining portions, and erecting fences. The soil varies greatly, but the most general is a medium friable loam, rich in some parts and thin on others. The five and six course rotations prevail, the latter being more general.

now than some time ago. A good many cattle are reared up on the higher lying parts from polled bulls and cross cows, but on the lower farms few cattle are bred. A large number of one and two year old cattle, mostly from Ireland, are bought in every year and fed off when two and a half or three years old. There are a number of very good sheep farms on the estates, the stock consisting mostly of blackfaced wethers. The arable farms vary in size from 30 to 400 acres, and the pastoral holdings from 150 to 3000 acres. There are few crofts on the property. The farmhouses, as a rule, are sufficient and in good order. At the home farm at Cortachy, Lord Airlie keeps a select herd of polled Aberdeen and Angus cattle, some very good Clydesdale horses, and has just introduced a small flock of well-bred Shropshire sheep. These will afterwards be noticed.

The Airlie estates may be taken as a good sample of the general character of the Braes of Angus, not only as to soil, surface, and system of farming, but also as to stock kept, the nature and extent of the improvements since 1850, and the increase in the rental. In the parish of Kirriemuir, which, including the village, has a rental of close on £32,000, there are a number of large well-managed farms, mostly on the estates of Clova, Glamis, and Kinnordy. On the farm of Sandyford, on the Glamis property, the enterprising tenant, Mr Thomas Lawson, has for a few years been conducting experiments on the growing of turnips with different kinds of manure which cannot fail to be useful and interesting to farmers. All along the foot of the Grampians the arable land has been gradually moving higher up. •Within the last thirty or forty years almost every holding adjoining the hills has been enlarged by the reclamation of lesser or greater patches of moorland, carried out mostly by the tenants, but partly by the proprietors. The land thus reclaimed is of fair quality in some parts, and yields profitably; but, generally speaking, it is of secondary quality, and has been only moderately remunerative. An extensive farmer in the parish of Tannadice states that there the farms range as a rule from 100 to 300 acres in extent, and that the soil is partly black loam of good quality, and partly thin and of a moorish texture. The five-shift rotation is the most general; but a good many are now adopting a seven-shift course, three years grass, followed by two grain crops, turnips, and oats or barley, with grass seeds. Under this rotation turnips are found to be less liable to damage by "finger and toe." The average yield of grain, barley, and oats is stated at about 5 qrs. per acre, barley weighing 53 or 54 lbs per bushel, and oats about 41 lbs. Potatoes, which are not largely grown, yield about 6 tons, turnips 20 tons, and hay 120 stones per acre. Potatoes and turnips get all the farm yard manure, and a mixture of about 5 cwt. of guano and dissolved

bones per acre. The sowing of grain is commenced about the middle of March, and turnip sowing about the middle of May. Harvest generally begins about the last week of August. Only a few cattle are bred, a large number being bought in and fed every year. The farms in this district have been much improved since 1850 by draining, fencing, and building, mostly done by money advanced by the proprietors on interest at the rate of 5 per cent. On the Tannadice estate, Mr Neish has expended a very large sum on buildings and other improvements within the last seven or eight years. He has spent as much as £2000 on the farm of Easter Balgillo, which is leased by Mr William Davidson at a rent of £525, and almost as much on some others. The fields on Mr Davidson's farm are all fenced with stone dykes and wire, and also well watered. The rent of land in this district averages about 35s., some farms being as high as £2 per acre.

Almost the whole of the parish of Careston, extending to 2113 acres, belongs to Mr John Adamson, Blairgowrie. The rental of the parish amounts to £2697, and all excepting the valued rental of the parish manse and glebe, and the public school-house, goes to Mr Adamson. The increase since 1856-57 is about £180. About 100 acres had been planted on the Careston estate some twenty-five or thirty years ago, but with that exception few improvements had been effected when Mr Adamson entered into possession about 1872. On the home farm an excellent farm steading had previously been erected at a cost of over £800 by Mr Stevenson, now of Blairshinnoch, Banffshire, and during the past six or seven years the present proprietor has done a great deal in the way of building, draining, and fencing. Additions, consisting mostly of covered courts, extra byre accommodation, and in some cases of a re-arrangement of the whole buildings, have been made to the steadings on the Home Farm, Hillhead, Peathill, Cowford, Knowehead, Balfour, and Blackhill. The cost of these additions ranged from £100 to £400. A great portion of the estate has been drained at a cost of from £6 to £7, 10s. per acre. Many of the old drained fields were re-drained by forming drains with two-inch pipes across the old drains, at a distance of from 15 to 25 or 30 yards apart. This plan has been found not only cheap but also quite as effectual as if a new drain had been cut between every two of the old drains; the new drains were not cut right across the old ones, but at an angle, while they were cut a few inches deeper than the old drains. As a rule, these improvements, carried out by the proprietor, have been charged to the tenants in the form of a certain percentage of interest. In some cases, however, they have been done free of interest. The tenants themselves have also improved their holdings a good deal. Dr Guthrie, who rents the farms of Nether Careston and Gateside at £879, 11s. 10d.,



has made improvements on the farm buildings, and has also drained some portions at his own cost. Mr Doig, Balfour, reclaimed large portions of rough pasture land on the farm of Knowehead, and also drained the new land and part of the old. Both these gentlemen are skilful and enterprising farmers, and by good management have very much improved the land they hold. The soil on the Careston estate, which also extends into the parishes of Menmuir, Fearu, and Lethnot and Novar, is very various. On the lower portions it consists of a deep rich alluvial soil, patches of it being light and sandy or gravelly. Along the centre of the property the soil is chiefly a deep loam of good quality, capable of growing excellent crops of all kinds of grain, turnips, and potatoes. On the upper portion the soil is thinner, but generally sharp and well suited to the production of turnips, oats, and barley. In moderately damp seasons it also grows grasses well. The richer land is farmed in the seven-shift rotation, and the poorer on the five or the "easy" six. The farms as a rule range from 200 to 300 acres in extent. There are about ten crofts, varying from 4 to 25 acres in extent, held under nineteen years' lease, the rent per acre being higher than the same land would bring in larger holdings. Very few cattle are bred in the district, a large number of Irish yearlings and two-year-olds being bought in and fed every year. Some very good crosses between Highland cows and shorthorn bulls are bred in the estate. The farm of Nathro is devoted wholly to sheep, and carries a good stock of blackfaced ewes which are crossed with Leicester tups. On a few other farms in the district, a number of blackfaced and crossbred sheep are reared and fed.

We are now in the neighbourhood of the ancient and royal burgh of Brechin, which with its noble castle, unique round tower, and beautiful cathedral, used as a parish church, has much to interest and delight visitors. In this district there are many large and remarkably well-managed farms. The farm of West Drums, on the south of Brechin, has been held by the same family for four generations, the present tenant being Mr William Smith, a gentleman of intelligence and experience in agricultural matters. The holding now includes three different farms. Situated on the Aldbar estate it extends to 450 acres, all arable; and in addition Mr Smith sometimes takes fields of pasture. The soil rests on the Old Red Sandstone, which comes very close to the surface, and of which there is an excellent quarry on the farm. On the better parts the soil is a good friable loam, and on others sharp but somewhat light. It is, on the whole, well adapted to barley and turnip husbandry; and of both these, as well as of oats, excellent crops are raised. The farm is all enclosed with stone dykes, and, with the exception of about 100 acres on the western boundary, it is well watered from springs. The fields

on these 100 acres are supplied by pumping. On the better land a seven-course rotation is pursued, three years in grass, all pastured, two white crops (sometimes varied by potatoes being taken on a suitable field instead of the second grain crop), turnips, and barley, with grass seeds. The thinner land is worked in the ordinary five-shift rotation. No hay is made in this part. On another portion, where the land is pretty heavy, the six-shift rotation is followed. One year's grass, cut for hay, is succeeded by oats, beans, or potatoes, or tares, or some of each, wheat or barley, turnips, and barley, with grass seeds. Wheat yields about 30 bushels, barley 36 bushels, oats 46 bushels, turnips 18 tons, potatoes 6 tons, and hay  $1\frac{1}{2}$  ton per acre. In specially good years these yields are considerably exceeded, but these figures represent the averages over a period of about seven years. Mr Smith manures liberally, and thus his farm is in high condition. Swedes and potatoes get about 18 loads, and yellow turnips about 12 loads of farmyard manure per acre, with about 4 cwt. of light manures, usually a mixture of dissolved bones and guano, with a little superphosphate and nitrate added when necessary. Latterly, he has been allowing about 4 cwt. of kanit extra per acre for potatoes, and by that he has succeeded in lessening the damage by disease. Mr Smith rears from 14 to 20 calves from cross cows and shorthorn or polled bulls. He also buys in and feeds a pretty large number of two-year-old crosses, mostly in the spring months, at the local markets, and from neighbouring farmers. These he puts on moderate fare at the outset, treating them more liberally as the season advances, and giving them when the grass begins to fail a supply of ground food, made up of beans, tares, and peas. This is given either in the house or on the grass fields, according to the weather. During winter they are carefully kept and well fed, being sent away as they become fat. The farm is fairly well supplied with houses. Both the dwelling-house and steading were erected in 1846. The former is large and very handsome; the latter is also pretty good, but would be improved by additions to the covered courts.

The farms of Broomknowe and Blackiemill, also on the Aldbar estate, the one in the parish of Aberlemno and the other in Brechin, are held by Mr Alexander Paxton at a rent of £500. They extend to 222 acres of arable land and 38 acres of permanent pasture. The soil is mostly light black loam on gravelly subsoil, somewhat liable to drought. Broomknowe is worked in the "easy" seven shifts, and Blackiemill on the five shifts. Oats average about 30 bushels per acre, weighing 43 lbs.; barley, 26 bushels, weighing 55 lbs.; and potatoes, about 7 tons. Turnips let at from £7 to £11 per acre. Hay yields about 180 stones per acre. Mr Paxton has for some years given his turnips about

20 cart loads of dung per acre, with 1 cwt. of guano and 2 cwts. of bone meal. The manure made on the farm is usually supplemented by about 500 loads of dung from Brechin. Within the last twenty-five years the proprietor has spent £1100 on farm buildings; while the tenant has himself expended £300 on houses and £200 upon draining. Only part of the land is fenced.

As already indicated, a large part of the extensive and valuable property owned by the Earl of Dalhousie lies in this part of the county. One of the best managed farms on the Panmure estate, in the parish of Brechin, is Barrelwell, held by Mr David Hume at a rental of £727. Situated within two miles of Brechin, this fine farm extends to 400 acres, and lies on the northern slope of the valley of Strathmore. The soil consists for the most part of black loam, the better portion resting on a substratum of limestone, and the less productive on a hard iron pan, which in some parts comes so near the surface as to barely afford a full furrow. The farm, which was held under one of the last of those famous "live and let live" life-leases on the Panmure property, came into the possession of Mr Hume about seven years ago. Since that time great changes have been effected, which have added largely to the value of the farm. A handsome and commodious steading was erected six years ago at a cost of between £2000 and £3000, of which £1600 was laid out by the late Earl of Dalhousie, and the remainder by the tenant. A great stretch of fencing has also been erected, while a considerable portion of the land has been re-drained, the proprietor supplying money for these improvements on interest at the rate of 5 per cent. The eight-shift rotation is pursued—three years grass, pastured all the time, and two green crops. While producing good crops of oats, often weighing 44 lbs. per bushel, and fair crops of wheat and barley, the farm is evidently best suited for turnips and potatoes, for of these it generally gives excellent results. Turnips average from 20 to 25 tons, and potatoes from 6 to 9 tons per acre. The dressing used for turnips, all applied in the drills, consists of 20 loads of dung, and from 5 to 6 cwt. of artificial manure, mostly phosphatic. Potatoes are similarly treated, except that a portion of the break is generally dunged in the autumn. The results are very much the same after autumn and spring manuring. Mr Hume, however, devotes his attention more to stock than to crops. Through the use of a very large quantity of artificial food, for which he invariably pays over £600 a year, he is able to feed a good many more cattle than the farm would naturally carry, and thus the soil is being enriched by very liberal doses of rich farmyard manure. The stock are generally bought in when two years old, home-bred cattle being preferred, the number required being made up of the best available class of Irish cattle. Every animal of the cattle tribe on the farm gets

cake all the year round, and in the course of the twelve months about 200 head of cattle are turned off to the butcher in the best condition. Mr Hume usually takes the grass and turnips on one or two adjacent farms as starting ground for the newly bought-in lots. During the last few years he has been buying in a few well-bred shorthorn cows at various sales over the country; and along with his extensive system of feeding he is gradually introducing the breeding of shorthorns. Already he has been very successful, alike in the breeding and feeding, having carried off several prizes both in the fat stock and breeding shows. About a hundred half-bred ewes, bought at the southern sales, are also kept, and from these and Leicester or Shropshire tups an excellent class of lambs is raised. The ewes and lambs are fed together on the fields, and sold as they become "ripe," the lambs being always away in June, and the ewes by the end of July. The most of the fat stock is sold to Montrose butchers, who kill largely for the London market. A flock of blackfaced wethers is likewise fed, either on Barrelwell or on some adjoining farm, every winter. As many horses are bred on the farm as maintains the required working "staff," with a pair to sell occasionally. They are of a very good kind, and have brought high prices.

Part of Lord Southesk's fine property lies in the parish of Brechin, where his lordship has some excellent farms, particularly those of Longhaugh, Windyedge, and Kincraig. The former two, along with a small farm adjoining each, are held respectively by Mr Robert Lyall Mustard and Mr William Mustard. These four farms, now leased by his sons, were entered by the late Mr Mustard, an enterprising, skilful farmer. The combined farms of Leuchland and Northtown of Leuchland extend to 430 acres, all arable, and are rented at £712. The soil consists mostly of medium loam of fair quality, some small portions being stiff and others very light. As a rule, the seven-shift rotation is pursued on Leuchland, but latterly one field has been allowed to lie three years in grass, the green crop being considerably improved by the alteration. On Northtown the five-shift system is followed. Taking the twelve years from 1858 to 1870, the average yield of undressed wheat on Leuchland would be 34 bushels, weighing 61 to 62 lbs.; barley, 40½ bushels, weighing 52 to 54 lbs.; and oats, 49 bushels, weighing 41 to 42 lbs. On Northtown the yield of barley would be about 39½ bushels, and oats 43½ bushels. The returns the last few years have been much under these. Potatoes vary greatly in the yield. Regents may be noted at from 4 to 6 tons, and champions at from 6 to 8 tons per acre. Yellow turnips average from 16 to 18 tons, and Swedes from 18 to 20 tons per acre. Hay in a good season yields about 200 stones of 22 lbs. each per acre, 240 stones being considered a very

good crop. For potatoes, from 17 to 20 tons of farmyard manure, and from 6 to 7 cwt. of artificial manure, consisting of  $\frac{2}{3}$ ths of bone meal,  $\frac{2}{3}$ ths of superphosphates, and  $\frac{1}{3}$ th of muriate of potash, are allowed per acre. Swedes get the same quantity of dung and light manures, the mixture of the latter being changed to  $\frac{2}{3}$ rds bone manures and  $\frac{1}{3}$ rd guano. Yellow turnips usually get about 12 tons of farmyard dung, with 6 cwt. of bone manures. No superphosphates are used for turnips. A few cows, usually six or seven, are kept; and from eight to ten calves, sometimes as many as twelve or fourteen, are raised. A large and good stock of feeding cattle is kept. The majority are bought in when fifteen or eighteen months old, and sent to the beef markets twelve or fifteen months afterwards. At times a lot of cattle two and a half years old are put in, and fed off in from four to eight months. The greater number are Irish bred animals, and when the two and a half year old cattle bought in come direct from Ireland, they generally require double the length of time to prepare for the butcher they would take when they have for some months previously been kept on this side of the channel. No sheep are kept, and only as many horses are bred as supply the farm. Mr Mustard has drained a good deal since the commencement of his present lease in 1868, and has also expended a pretty large sum in altering and covering cattle courts and in erecting wooden sheds. About twenty years ago the proprietor erected two new cottages, on the cost of which the tenant paid an easy rate of interest. A few years thereafter about 37 acres of moorland were reclaimed, the proprietor advancing on interest the cost of the tiles and the cutting of the drains, and the tenant doing all the other work. This land has since been attached to another farm for which it is more conveniently situated, at a rent of 30s. an acre. The fields are as a rule well watered, but deficient in fencing. The steading is old, and not very convenient.

Between the parish of Brechin and the Grampians, mostly in the parishes of Menmuir and Stracathro, there is a large extent of land, not a little of which has been reclaimed within the last forty or fifty years. Since 1856 the rental of Menmuir has risen from £5833 to £8487 this year; and that of Stracathro from £4335 in 1856, to £6614 this year. These are very substantial increases, and are due in a large degree to the transformation of moorland into productive fields. The soil varies greatly. It is generally a light loam, of moderate depth and fertility in some parts, and very thin and poor in others. It lies partly on red-sandstone, limestone, trap rock, slate, and primary rocks; and is rented at from 15s. to 30s. per acre. The new land reclaimed since 1850 consists for the most part of small patches taken in here and there by tenants, but in a few cases the extent exceeds a hundred acres. Perhaps the most extensive scheme of re-

clamation carried out in recent years is that so successfully accomplished on the estates of Lundie and Parkland, by the proprietor, Mr George Shepherd. Situated partly in Menmuir and partly in Stracathro, this property was purchased in 1860 from the Earl of Kintore by Mr Shepherd for the sum of £11,000. The total extent is 1145 acres. At the time of the purchase 342 acres were under cultivation or partially reclaimed. Since then Mr Shepherd has reclaimed about 400 acres. The work was commenced in 1863 when the leases on the property expired, and carried out gradually. Nearly the whole extent was reclaimed by ploughing, in some parts with two horses, a furrow being taken down hill only, but generally with four horses, making a furrow both ways. In a few spots spade trenching had to be resorted to. Before being ploughed the land had to be cleared of whins and broom, and many surface boulders removed; while two or three men followed the plough, digging up the larger stones and throwing them on the ploughed land. The larger stones were carted to lines fixed for stone wall fences, in which they have been turned to good account; and the smaller ones to convenient situations, to be utilised in the forming of drains and roads. The ground was next harrowed until a surface fit for receiving oats was obtained; and as soon as it was in season it was sown with oats at the rate of from 6 to 7 bushels per acre, along with 5 or 6 cwt. of artificial manures. Three crops of oats were generally taken in succession, the number of crops being regulated by the rate at which the sod decomposed. Turnips followed the oats, but before these were sown, the land received from 2 to 3 tons of lime per acre. When it could be obtained dung was given, and when it could not artificial manures alone were used, the mixture usually consisting of bone and mineral phosphates with a small proportion of ammoniacal manures either in the form of guano or nitrate of soda. With this treatment good crops of turnips were always obtained. A grain crop with grass seeds followed—barley where dung had been applied, and oats where the artificial manures were used alone. The new land was thoroughly drained, generally after the second or third oat crop, the most satisfactory system being 3 feet drains, at 24 feet apart. Stones were used for a number of years, but as the price of labour advanced, tile drains were found to be less expensive and equally efficient. These operations, together with fencing, road making, and the erection of buildings, entailed an outlay of about £30 per acre. The cost was made up thus:—ploughing, clearing the land of stones, draining, ditching, fencing, liming, and dunging, £20; roads and buildings, £10. There still remains about 100 acres suitable for reclamation. The soil is mostly a friable loam with a subsoil of good red clay, intersected by bars of "pan" which decompose

after drainage. Where these bars do not decompose, they are raised by the subsoil plough and lifted off the field along with the stones. Part of the estate, lying into the valley of Lethnot, rests on gravel, and is retained in grass on account of its suitability for sheep. The new land is cropped in the six-shift rotation—three years grass, one green crop, and two grain crops, partly oats and partly barley. Oats yield about 4 to  $5\frac{1}{2}$  qrs. per acre, and barley 4 qrs. The climate is wonderfully good, the land being comparatively free from hoar frosts which do damage in the valleys. The crops generally ripen as soon as any in the district, unless in the parts near the sea. The elevation of the arable land ranges from 300 to 700 feet, the greater part being about 400 feet. The new land yields very satisfactorily when treated (as a large proportion has now been) in the manner indicated. The old land has required similar treatment as to draining, stone clearing, manuring, and in other respects, and as a rule yields equally as well as the new land. In addition to the reclamation of these 400 acres, about 4000 yards of roads have been made, at a cost of 2s. per yard. A dwelling-house, cottar houses, and farm steading have also been erected. When the estate was bought there were no houses upon it. It was held as a sheep-run by adjoining farmers. The threshing-mill is driven by water, obtained from a bog about half a mile distant. About 60 acres have been planted, while hedgerows with trees at intervals divide some of the fields. The soil is admirably adapted to the growth of wood. Larch and Scotch fir are thriving beautifully on the highest portion, about 800 feet above sea level. A good quarry has been opened on the estate. Here a very fine quality of red sandstone is easily obtained. It is light in colour, easily wrought, very durable, and is almost entirely free of the hard pebbles that abound in much of the sandstone in the neighbouring districts. The stock kept consists of cattle and sheep. Irish cattle are bought in lean, and fattened on the holding. Blackfaced ewes are bought in the higher reaches of the North Esk and Westwater, and from these and Leicester tups a good class of lambs is reared, which when sold in the autumn bring from 25s. to 29s. a head.

Most of the land in this neighbourhood suitable for reclamation has already been brought under the plough. Almost all the recent reclamations have been carried out by tenants, and have as a rule turned out well. Much of the old land would be greatly improved by more thorough drainage and by deeper cultivation. On the farms of Longhaugh and Kilgarie, on the estate of Balnamoon, and in the parish of Menmuir, Mr David Fairweather, the enterprising tenant, has, within the last twenty years, reclaimed over 300 acres by ploughing and trenching, at a cost of from £12 to £15 per acre. The land before being reclaimed consisted

of bog or moor. The soil is now mostly light loam, resting partly on a hard pan and partly on clay. In consideration of these reclamations, Mr Fairweather obtained the farm at a small rent, on a lease of twenty-five years' duration. On the cost of draining and building, which was advanced by the proprietor, the tenant pays interest at the rate of 5 per cent. The land is worked on the seven-shift rotation, with three years grass. The yield has been fair and the grain up to the standard weight. Grass has done well since the land was limed. The new land paid well as long as the turf lasted. A stock of young cattle is kept, being obtained and disposed of at local markets.

Retracing our steps, we again pass Brechin and take a run through the Howe of Kinnaird, and the parishes of Logiepert and Montrose, leaving the county at its extreme north-eastern corner. The Howe of Kinnaird is one of the most beautiful parts in the county. It is well wooded and well farmed, and is adorned by Kinnaird Castle and grounds, one of the most charming country seats in the kingdom. The soil is mostly alluvial, in some parts stiff tenacious clay, and in these untoward times and bad seasons it has proved a somewhat stubborn subject to deal with. A large portion lies so low that it is liable to be flooded. A good many hundred acres indeed lie below high-water mark at spring tides. The thorough draining of the Howe has therefore been an exceedingly difficult matter. There is no doubt that, if thoroughly drained and well limed, the land would be about the richest in the county; and in these respects it will in all probability before long be greatly improved. In the parish of Logiepert, which is bound in on the north by the North Esk, there are several large skilfully managed farms. Brae of Pert, on the estate of Stracathro, and rented by Mr Andrew Couper at £1200, is about the largest. It extends to 670 acres, all arable. The soil in this district varies from light gravelly loam to strong hard clay, a pretty large extent being good sharp medium loam on a moderately open subsoil. The better land is worked in the seven-shift rotation, with two green crops, and the thinner soil in five or six shifts. In a good season wheat yields about 4 qrs. per acre, weighing 60 to 64 lbs. per bushel; barley, 5 qrs., weighing 53 to 56 lbs.; and oats, 6 qrs., weighing 42 to 44 lbs. Turnips usually get about 12 loads of farmyard manure, and about 6 cwt. of bones and other light manures per acre. Potatoes get 14 loads of dung and 3 cwt. of potash and bones. Harvest commences between the middle of August or 1st of September. A large stock of Irish and home-bred cattle, the former forming the large majority, are fed in this district. A good many sheep are also fattened or wintered. For both cattle and sheep, cake and bruised grain are extensively used, much more so now than formerly. On the farm of Brae of Pert and others a great deal



has been done within recent years, both by the proprietor and tenant, in the way of draining, building, and fencing. Rent varies from 25s. to 40s. per acre. The farm of West Ballochry, also on the Stracathro estate, is held along with West Mains of Keithock by Mr Charles Martin. West Ballochry extends to 260 acres, and is rented at £476. The soil is black loam with clayey subsoil on two-thirds of the farm, and gravel and sand on the remainder. The seven-course rotation is pursued. Wheat yields about  $3\frac{3}{4}$  qrs., barley  $3\frac{1}{2}$  qrs., oats 5 qrs., potatoes  $6\frac{1}{2}$  tons, turnips 14 tons, and hay 150 stones of 22 lbs. each. Potatoes get from 15 to 20 loads of farmyard manure per acre; and turnips about the same, with the addition of 3 or 4 cwt. of guano and dissolved bones. Mr Martin rears about twenty calves, and also keeps about forty one-year-old and thirty two-year-old cattle, besides ten cows. When potatoes are cheap they are given along with or instead of turnips, cake and bean meal being also largely used in the feeding of cattle. Mr Martin has reclaimed a portion of land from natural pasture, while the proprietor has drained almost the whole of the holding, and built a dwelling-house and farm steading, the tenant paying interest on the outlay at the rate of 5 per cent., and performing all carriages free. The land has been fenced, partly by the proprietor and partly by the tenant.

#### KINCARDINE.

We commence with Kincardine, as we did with Forfar, at its extreme south-eastern corner—at the mouth of the North Esk. And, as in Forfar, we find the first farm, that of Stone O' Morphie, held by Mr William Smith, a gentleman of extensive and accurate knowledge of farming, and a noted breeder and judge of polled Aberdeen and Angus cattle. This fine farm is situated on the estate of Morphie, in the parish of St Cyrus, lies close to the North Esk, and is rented at £913, 8s. The soil is variable; very rich loam on some parts, thin sharp loam on others. The better fields are rented as high as about £3 per acre. In good seasons beautiful crops of wheat, barley, oats, potatoes, and turnips are grown, the land being maintained in very high condition. A large number of cattle, bought in as yearlings or two-year-olds, mostly at the latter age, are fed on the farm, partly on the grass fields and partly in the courts. Both inside and on the fields a large quantity of feeding stuffs is used. Mr Smith's lease is almost exhausted. During it he has expended about £300 on the repairing of the farm steading, and about £200 in the purchasing of moveable fences, while the proprietor has erected servants' cottages. The adjoining farm of Morphie, rented by Mr James Adamson at £1000, is also managed with skill and success. It contains a good deal of rich loam and some rather thin soil, mostly sharp and sound however.

The parish of St Cyrus is about the best favoured in the county in regard to soil and climate combined. It extends to 8718 acres, and brings a rental of £18,028, or more than an average of £2 per acre. The increase since 1855 amounts to no less than £5219, or close on 12s. per acre. The soil is mostly good sound loam, pretty strong in some parts and light in others, but as a rule very fertile. The subsoil is partly decomposed red sandstone, partly of a clayey nature and partly gravelly. The better class of land is worked mostly on the six-shift rotation with two green crops. Some work in four shifts with one green crop, partly potatoes. A considerable extent is put under beans and potatoes on the richer lands. The principal estate is Lauriston, owned by Mr D. S. Porteous. As on the other properties, a good deal has been done here within the last twenty-five years, in the way of draining, fencing, and building. On the smaller parish of Benholm which adjoins on the north, there is also a considerable proportion of excellent soil—good deep fertile loam, well suited to all the ordinary crops. It is farmed in a way similar to the better lands in St Cyrus, and yields fully as well. Here also, however, there is some light loam, chiefly on the higher parts, and likewise some portions of close hard land that can scarcely be made even fairly fertile. This parish extends to 5216 acres. The rental is £8167, the increase since 1855 being £1532. The largest property in this parish belongs to Mr Hercules Scott of Brotherton, one of the most enterprising and liberal-minded landlords in the county. He takes a lively interest in everything that tends to promote the interests not only of his own tenantry but also of the county generally. In the shape of draining, fencing, reclaiming, building, and other works, he has carried out extensive improvements on his well-managed and highly cultivated property. The lands of Benholm, formerly owned by the Baroness De Virte, were purchased in July 1879 by Mr William Smith, Stone 'O' Morphie, for the sum of £25,600. The property extends to 740 acres, yields a rental of about £1000, and is altogether one of the most desirable little estates in the county. In 1877 the property was carefully gone over by Mr George James Walker, Hillside House, Portlethen, a gentleman experienced in the valuation of land, and by him it was estimated as worth £31,100,—a sum which in all probability would readily have been obtained some five or six years ago. The soil is mostly strong fertile loam, only a very small portion being light. Benholm Castle, which is being extended and renovated by Mr Smith, is beautifully situated in the midst of extensive and well laid out policies. The home farm, extending to 167 acres and rented at £373, was taken over by Mr Smith at the expiry of the lease at Martinmas 1879, and is to be farmed by himself.

We next enter the parish of Bervie, which extends to 2447 acres, and yields a rental of £3368. The increase since 1855 is £1332. Here also there is some good loam, but the soil generally is lighter than in Benholm and St Cyrus. The largest property here is that of Hallgreen, in which there are a few good large farms, rented at from £160 to £635. The much larger parish of Arbuthnott lies on the north, stretching from near the sea side far inland. Extending to 9623 acres, it yields a rental of £9916, the increase since 1855 being £2400, or about 5s. per acre of the total extent. Lord Arbuthnott is the chief proprietor in this parish. His fine estate, situated in a well-favoured part of the county and extending into several parishes, is stated in the Parliamentary Return of Owners of Lands and Heritages, 1872, to comprise 13,560 acres, and to yield a rental of £13,036, or very close on £1 per acre all over. The improvements effected on this desirable property within the past twenty-five years have been very extensive and costly. The arable area has been slightly increased in several parts; but the principal works have been the erection of new farm houses, and the draining or re-draining of land. In the erection of houses in particular, a very great deal has been done, a large number of very handsome and commodious farm steadings having been erected all over the property. In every case the tenant performs the carriages free, and generally also pays a certain percentage on the outlay by the proprietor, the works being invariably executed under a private arrangement between the proprietor and each individual tenant. A large extent of land has been drained since 1850, while some fencing has also been erected. In this latter respect, however, there is still a great deal to be done. There are a large number of extensive and well managed farms on this property. An intelligent and extensive farmer on the Arbuthnott section of the property states, that the soil varies a good deal, but is mostly a medium loam or pretty strong clay, parts being thin and moorish. The ordinary five-shift rotation is the most general, but a few are now taking to a seven course—two crops of oats in succession, one of turnips with a small portion of potatoes, one of barley, and three years of grass. Some farmers are also working on six shifts, with only one crop of grain between grass and turnips. Under both these latter systems turnips are found to be less liable to damage by “finger and toe” than under the five shifts. There is great variety in the yield of grain. Last season (1879), on some farms oats and barley did not exceed  $1\frac{1}{2}$  qr. per acre. In an average season, however, the yield would be about 5 qrs. per acre, barley weighing about 54 lbs., and oats 42 lbs. per bushel. Potatoes yield about 6 tons, turnips about 15 tons, and hay about  $1\frac{1}{4}$  ton per acre. In many cases these figures would be

greatly exceeded, but as an average they are not far wrong. On some of the best managed farms, turnips receive about 25 tons per acre of farmyard and Aberdeen city dung mixed; and potatoes about 20 tons of farmyard manure, very little artificial manure being used. On other farms, also skilfully and successfully managed, a lesser quantity of dung is given, the dose being supplemented by from 4 to 6 cwt. of artificial manure per acre, mostly bones in different forms, guano, and superphosphates. Sowing of grain is commenced between the middle of March and first week of April; and of turnips about the 15th of May. Harvest, as a rule, begins between the 1st and 10th of September. On every farm a few cows are kept, but only a very small number of the cattle fed upon it are bred on the estate, or even in the county. A large number of Irish and other cattle are bought in every year, and fed off when two or three years old. A large quantity of cake, potatoes, grain, and maize is used in feeding, along with turnips, straw, and hay. A good many sheep are wintered on the property. The farm of Gyratsmyre is held, along with another farm, by Mr John Taylor. The extent of the two is 368 acres arable, and 120 acres of hill pasture. The soil varies. Some fields are of black loam, some clayey, and others moorish. Most of the land is worked in five shifts. The average yield of barley would be about  $4\frac{1}{2}$  qrs. per acre, weighing 53 lbs. per bushel; oats 5 qrs., weighing 40 lbs.; potatoes, 6 tons; turnips, 16 tons; and hay about  $1\frac{1}{2}$  ton per acre. A breeding stock of cattle—mostly crosses with a few shorthorns—is kept on the holding. The crosses are fed off when two years old, and the shorthorn bulls sold either when newly weaned or when one year old. The feeding stock get linseed cake for several weeks before being sent to the butcher. At one time a lot of breeding ewes were kept on this farm, but cattle now form the whole stock. Cattle are now fed off a year younger than they were some years ago. Most of the farm has been fenced by the tenant, the proprietor having done a good deal in the way of building and draining. Rent in this district runs from 20s. to 30s. per acre. One of the largest holdings in the county is that of Pitcarry and Clashendrum, on the estate of Pitcarry, in the parish of Arbuthnott, and leased by Mr J. Blythe Myles. It extends to 540 acres arable and 70 in rough pasture. Five pairs of horses are kept at Pitcarry and one at Clashendrum, the one farm adjoining the other. About 54 acres consist of stiff red clay, 40 acres free to moorish land, 100 acres friable black loam, and the remainder good strong land, well adapted for grain. The stiff land is worked in the six-shift rotation, three grain crops, and two green crops, and one year in grass. The ordinary five-shift rotation is pursued on the other portion. In a pretty good year barley yields about

5 qrs. per acre, weighing about 54 lbs. per bushel; oats from 5 to 8 qrs., weighing from 40 to 42 lbs.; potatoes from 5 to 8 tons; turnips, 14 to 20 tons; and hay from 100 to 150 stones per acre. Turnips get 12 loads of farmyard manure per acre, with two cwt. of bones, and 2 cwt. of superphosphate; while potatoes get about the same quantity of farmyard manure, with 2 cwt. of a potato manure and 1 cwt. of sulphate of potash. A good deal of beans are grown on the farm, and these are sown early in March. Potatoes are planted between the middle of March and the second or third week in May. Mr Myles prefers to plant them early. During summer, about 100 head of cattle are kept, the stock in winter being increased to 130 or 140. Few are bred on the farm, the large majority being purchased in the south. Cake and grain are liberally used in the winter feeding. The farm steading has lately been improved by the proprietor, the tenant performing the carriages. The tenant has also carted on to the farm a good deal of lime and manure, since he entered, two years ago. The fields are all well watered, but badly fenced, almost all the fences being of wood. There is a pretty fair supply of servants' cottages on the farm.

Turning southwards, we enter the somewhat cold hilly parish of Garvock. On the slopes of the Garvock hill, which, almost in a direct line between the villages of Laurencekirk and St Cyrus, rises to a height of 915 feet, the soil is mostly either thin or medium loam, resting on a hard subsoil, or stiff clayey loam lying on a cold sour bottom. Extending to 7982 acres, this parish has a rental of £7134, the increase since 1855 amounting to no less than £2919, or about 7s. 6d. per acre of the total extent. Considering that a large portion of this parish consists of uncultivated hilly ground, this increase must be regarded as very large. As already indicated, a large extent of land has been reclaimed on the slopes of the Garvock hill during the last twenty-five years, and this in a great measure accounts for the long stride in the rent-roll in that period. A very large sum of money has also been spent since 1855 in improving the old lands and farms by draining, building, and fencing; and this, of course, had likewise done much to increase the annual value of the parish.

On the west of the southern end of Garvock, lies the fine agricultural parish of Marykirk, comparatively level and low-lying, the greater portion being under 200 feet above sea level. Marykirk extends to 9912 acres. The rental is £11,653, or about 23s. 6d. per acre. The increase since 1855 is equal to nearly 6s. per acre of the whole area. The principal estates in this parish are Inglismaldie, Kirktonhill, Thornton, Luthermuir, Balmakewan, and Balmain. A large portion of the land consists of good sound fertile loam, lying on decomposed red sandstone,

and well adapted to all the ordinary crops. On the richer land the six and seven shift rotation is pursued; and on the thin soil, the five-shift rotation, with one green crop. The beautiful and extensive parish of Fettercairn lies on the west. Extending to 13,803 acres, it yields a rental of £12,056, the increase since 1855 being £2644. The principal estates in this parish are Fasque, Fettercairn, The Burn, and Balmain. On Colonel M'Inroy's desirable little property of The Burn, a good deal of improvement has been effected during the past twenty-five years; while on Sir A. E. Ramsay's estates of Balmain, a very large sum of money has been laid out during that period on reclaiming, planting, draining, building, and fencing. On Balmain about 30 acres of old woodland were trenched and drained and made arable by the proprietor, while about 100 acres were planted. Most of the farm steadings have either been renewed or added to and improved by the proprietor since 1855, the tenants generally paying interest on the outlay. All these improvements, however, are made the matter of private arrangement between the landlord and tenant. The farms on the Balmain estates range from 30 to 300 acres in extent, there being in addition about twenty crofts, ranging from 5 to 15 acres. All the farms and most of the crofts are held on leases of nineteen years' duration. Several crofters hold their land from year to year, but even among these very few changes take place. The soil is mostly sharp medium black loam, deep in some parts and thin in others. The subsoil is partly adhesive clay and partly a mixture of gravel and clay. On the richer, blacker land, a seven course of cropping is pursued,—three years grass, oats, potatoes along with smaller portions of beans, vetches, and cabbages, or a small division of oats a second time, then a full shift of turnips, followed by barley with grass seeds. On the thinner land the ordinary five-shift rotation is followed. On good land oats average about 6 qrs. per acre, weighing about 42 lbs. per bushel; barley, 4½ to 5 qrs., weighing 54 lbs.; potatoes, 5 to 6 tons; and turnips, 20 tons. Potatoes get 16 to 20 loads of farmyard manure per acre with 2 cwt. of dissolved bones; and turnips about the same quantity of dung, with 3 or 4 cwt. of dissolved bones and other light manures. Only a small number of the cattle fed in the district are bred in it. Mr. Smith, Balmain, keeps a few shorthorn cows, and also breeds a few cross; but the general custom is to buy in Irish cattle at one and a half year old, and feed them off within a year or fifteen months. Excluding the higher and poorer lands, the average rent in this district is about 30s. per acre. Around the village of Fettercairn there is some very fine heavy loam, rented at about £2 per acre, or even more. The Fettercairn property contains some very rich land, mostly of the nature of clayey loam, with a good open subsoil.

The Fasque estates, now by far the most extensive in the county, have been acquired at different times since about 1825 or 1830. About that period the late Sir (then Mr) John Gladstone purchased the adjacent properties of Fasque and Balfour, and some time afterwards that of Phesdo in the same neighbourhood. Then followed Balnakettle and Little and Meikle Strath Balbegno, and last, but not least, the immense property of Glendye. The last, by far the largest, was purchased about twenty-five years ago by Sir Thomas Gladstone, the present owner, from the Earl of Southesk, the price having been fixed by the late Mr Walker, Portlethen. It adjoins the other estates excepting Phesdo, which is detached but not far distant, and thus the Fasque property now extends from the village of Fettercairn to within less than 10 miles from Banchory on Deeside, a distance of over 16 miles. The total area is not far short of 49,000 acres. By far the greater portion lies on the Grampian range, and consists of black heath-clad hills intersected by numerous valleys or small straths in which there is a good deal of green pasture. On the Glendye property there are several small farms on the lower parts towards Banchory, while on the other estates there is a large extent of excellent arable land, mostly good rich loam, strong and deep in some parts and thin in others, but all over sound and fertile. The property contains a great deal of valuable wood, not a little of which has been planted by Sir Thomas and his father. At the time Fasque was purchased by Sir John its woods were valued at £10,000, and since then its plantations have been increased by several hundred acres. The plantations on Phesdo extend to about 103 acres, and those of Balfour to 215 acres; while on the Glendye property, Sir Thomas has planted about 2500 acres. Around the mansion-house of Fasque there are many trees of great dimensions and rare grandeur. The mansion-house, a large palatial-looking edifice, was built by the Ramsays of Balmain in 1808-9, and is said to have cost about £30,000. The policies are extensive and beautiful. A picturesque finely situated lake, extending to about 20 acres and formed by the late Sir John, adds greatly to their beauty. The home farm, extending to 670 acres, including the farm of Bogendello, is held by the proprietor. About 150 acres around the mansion-house lie under permanent pasture. The other portion is worked in the ordinary five or six shift rotation, and as a rule excellent crops of barley, oats, and turnips are raised. The soil on the lower parts consists of good black loam, what is known as excellent barley and turnip land, and on the higher parts the soil is lighter, but also fertile. Almost the whole has been re-drained lately and also well fenced. Barley yields from 4 to 5 qrs. per acre, weighing from 50 to 54 lbs., and oats from 5 to

7 grs., weighing from 40 to 43 lbs. Turnips grow exceptionally well, yielding as much sometimes as 30 tons per acre. A very commodious and substantial farm steading, with all the modern comforts and conveniences, was erected on the home farm in 1872. It was built from a design by Mr Murray, the local factor on the property, and is altogether one of the best steadings in the county. The cattle courts are covered, and are extensive. A saw mill, carpenter's and blacksmith's shops adjoin the steading, the saws and other machines being driven from the water-wheel, which also drives the threshing mill. These conveniences enable Sir Thomas to accomplish by his own employees a good deal of the estate work. An excellent herd of polled cattle is kept at the home farm, as also some very good sheep. The herd will be referred to afterwards.

Proceeding eastwards from Fasque we enter the parish of Laurencekirk, in which there is a large extent of good land, clayey loam in some parts, deep strong loam in others, and thin loam on the higher portions. Extending to 5617 acres, this parish has a rental of £12,710, the increase since 1855 being £5198, or not far short of £1 per acre. A good deal of this very large increase is no doubt due to the growth of the village of Laurencekirk; but it is equally certain that there has also been a very large increase in the agricultural rent of the parish. The principal estates in this parish are those of Haulkerton, belonging to the Earl of Kintore, and Johnston, owned by Mr and Mrs Pearson. On the former there are several large and very good farms, on which a most advanced system of farming is pursued. That of Bents of Haulkerton, occupied by Mr William Alexander, is specially worthy of mention. On this estate a good deal has been done in the way of building and draining since 1855. The Johnston estate extends to about 1010 acres—800 arable, 40 under natural pasture, and 170 under wood. The gross rental amounts to about £1800. Near the village of Laurencekirk the rent is as high as £3 per acre, while on the higher parts it is below 20s. Since 1850, some draining and building and other improvements have been effected on the estate. The soil is mostly of a clayey nature; the five-shift rotation being generally pursued. The home farm extends to 200 acres arable and about 80 of wood pasture. A good many small crofts are held by villagers on leases of ten years' duration, and at rents as a rule higher than those paid for larger holdings.

Fordoun, the most important agricultural parish in the county, lies on the north of Laurencekirk. It extends to 26,937 acres, and yields a rental of £21,307. The increase since 1855 amounts to no less than £5358, or close on 4s. per acre of the total area. The soil varies greatly. A large portion is strong



clayey loam, a considerable extent good medium loam, and a pretty large area light loam. The subsoil is a mixture of clay and gravel in some parts, and hard gravel in others. Lord Arbuthnott owns some excellent land in this parish; his larger farms being Cairnton, leased by Mr Falconer, and East and West Cairnbeg, held respectively by Mr Brown and Mr Johnston. Cairnton extends to 525 acres, all arable; and was obtained by Mr Falconer at Martinmas 1878. The soil on the lower fields is good friable black loam, a little stiff in some parts, while towards the hill it becomes light. The land is not well suited for wheat, and therefore it is grown only to a limited extent. The better land is worked on a seven-shift rotation,—two years grass, oats, potatoes, wheat, turnips, and barley with grass seeds. A portion of a new steading, consisting of stables, cart sheds, and cattle courts, wholly covered, has just been erected by the proprietor, the tenant performing the carriages; while in draining, about £700 have been spent by the proprietor since Mr Falconer entered. On that sum the tenant pays interest at the rate of 4 per cent. Barley yields about 5 qrs. per acre, and weighs 54 lbs. per bushel; wheat,  $3\frac{1}{2}$  to 4 qrs., weighing from 63 to 64 lbs.; and oats, from 5 to 6 qrs., weighing from 40 to 43 lbs. In an ordinary year harvest usually commences between the middle or the end of August, in the earlier parts of the parish. Mr Falconer feeds a large number of cattle, bought in mostly when eighteen months or two and a half years old, and fed off during winter. Latterly, he has been giving the Canadian cattle a trial. He buys them at Glasgow in the autumn, paying from £13 to £18 a head for them. They are mostly strong lean cattle, three or four years old, and larger than could be purchased from Ireland at the same money. They usually weigh from 6 to 8 cwt. when “ripe,” and as yet they have paid well. Mr Falconer also holds the farm of Candy on the Drumlithie estate. On that farm about 70 or 80 acres of mossy land were reclaimed about seventeen years ago. At that time the rent was only about £200; now, it is exactly double. In Fordoun rent runs from £1 to £2, while towards Laurencekirk some of the best land is rented at close on £3 per acre. Among the other large farms in Fordoun may be mentioned that of Pitarrow, on Mr Crombie’s estate of Pitarrow, and occupied and very carefully managed by Mr Hugh Bisset. This farm extends to 400 acres, and is rented at £602. The soil is mostly a heavy loam, mixed with clay, part of it being in some seasons rather difficult to “make” properly. The five-shift rotation is stipulated in the lease, and it is the system most generally followed in the district. There are many exceptions to it, however, and proprietors do not hesitate to give some freedom to a good farmer. Barley and oats yield about 5 qrs. per acre, the former

weighing 54 and the latter 43 lbs. per bushel. Hay yields 200 stones and potatoes about 6 tons per acre. For turnips Mr Bisset gives about 15 tons of farmyard manure per acre with about 3 cwt. of bones and guano. About one half the cattle stock is bred on the farm, the other half being bought in in summer or autumn. The feeding cattle usually go to the butcher when from two and a half to three years old. Last year (1879) Mr Bisset fattened a lot of Canadian bullocks that paid remarkably well. Very extensive improvements have been effected on this farm during the past twelve years. The proprietor erected, at a cost of £3500, a very large and commodious steading, one of the best indeed in the county. The tenant performed all carriages free, but pays no interest on the proprietor's outlay. He has, however, expended a large sum on draining and liming a large portion of the farm. The farm is well watered, but not so well fenced. What fences there are consist of wire erected by the tenant. Nine pairs of horses are employed in working the farm, which is maintained in high condition.

Passing northwards into the parish of Glenbervie we find in it great variety of soil and surface. The land is very uneven, but excepting around Glenbervie House, which has a snug and beautiful situation, it is not well wooded. The largest estates in this parish are those of Glenbervie, owned by Mr J. Badenach Nicolson, and Drumlithie, belonging to Mr John Miller, Edinburgh. On the latter a large sum has been expended on reclamation, draining, and building within the last twenty years; while on the former, a great deal has been done in the way of draining, building, and general estate improvements. The Glenbervie estate extends to 8481 acres, and yields a rental from land of £3683, being an increase of about £500 during the last twenty-five years. A survey, taken about thirty years ago, shows the arable area at that time to have been 2985 acres, the natural pasture 3850 acres, and the woods 116 acres. Since that time, however, a pretty large extent has been added to the arable area, while between 200 and 300 acres have been planted. Within the last twenty-five years more than £10,000 has been expended by the proprietor on general agricultural improvements on the estate; and, in addition, the tenants have, by draining small pieces, reclaiming little corners, and other works, done a good deal to ameliorate the condition of the property, which is now far superior to what it was thirty years ago. The late Mrs Nicolson, mother of the present proprietor, took advantage at an early period of the Drainage Loan Act, having, prior to 1855, obtained under that Act about £4500, which was spent in forming about 90 miles of subsoil drains on the Glenbervie estate. That sum has now been wholly cleared off by interest

paid by the tenants. If the drains were put in at the commencement of a lease the tenant paid the full amount of interest, which was  $6\frac{1}{2}$  per cent., but if the work were done during the currency of a lease only 5 per cent. was charged against the tenant. All the recent improvements have been carried out under private arrangements between the proprietor and each individual tenant. Mr Nicolson also owns the smaller estate of Auchterhouse, in the parish of Garvock. Here also a large sum has been expended on permanent improvements. Since 1855 the rental has increased from £500 to £740. As leases expire on both estates arrangements are made for the improvement of the houses and for other desirable works; and particularly in regard to building there is still a good deal remaining to be done. The soil varies from good strong, fertile, clayey loam to thin loam lying near the rock or on a hard pan. On the better parts the subsoil is gravel and clay. The five-course rotation has long been the rule on the estate, but Mr Nicolson, who is a popular and painstaking landlord, has been encouraging his tenantry to grow a greater extent of grass, and devote still more attention to the rearing and feeding of stock. On suitable land, and under good management, he allows two successive grain crops to be grown when the tenant desires to have that advantage. The portion of Glenbervie that extends on to the Grampian Hills, about 2400 acres, is held as a sheep farm by Mr Lindsay, bank agent, Montrose. Mr Nicolson enclosed the whole of this farm by a substantial fence; and his experience has been that, with the little "hunting" thus required by dogs, the grouse and sheep thrive together most admirably. Under the lease it has been arranged that the heath on one-ninth of the farm shall be burned every year, the tenant giving assistance in the burning. The stock kept are of the blackfaced breed.

Between Glenbervie and the sea lie the parishes of Kinneff, Catterline, and Dunnottar. The combined parish first named extends to 7249 acres, and has a rental of £8751, or more than an average of 24s. per acre all over. The increase since 1855 amounts to close on £2000, or over 5s. 6d. per acre of the total extent. Dunnottar extends to 7884 acres, and has a rental of £11,248, or not far short of 30s. per acre. The increase during the last 25 years is equal to more than 7s. per acre. The soil varies greatly in these two parishes. In some parts there is stiff clay, in others deep rich loam, on the heights thin poor loam, and on what may be called the main body of the parishes a medium loam, rather light, but sharp, sound, and fertile. The land is worked mostly on the five and six shift rotations, with one green crop. It is, as a rule, well cleaned and liberally manured, and yields comparatively heavy crops. On the Kinneff and Catterline properties in Kinneff, on the estate and lands

of Dunnottar, and on the Barras estate in both parishes, there are several large farms of good land, which being managed in a skilful and liberal manner are made to produce excellent crops. One of the largest and best managed farms in this district is Fernyflatt, on the Kinneff estate, which contains some very good loam, and produces excellent crops. The farms of Harvieston and Beedlieston, also in the parish of Kinneff, and occupied respectively by Mr George Greig and Mr Walker Campbell, are likewise large and are worked in a no less skilful manner. Mr Greig has given great attention to cultivation by steam, and on his own and other farms employs steam extensively and with much success. The improvements on the different estates in these parishes within the last twenty-five years have been extensive and varied, very similar indeed both in nature and comparative cost to those executed in that period on the Glenbervie estate. These remarks apply equally well to the various estates in the parish of Fetteresso which lie on the north of Dunnottar. Extending to 27,528 acres Fetteresso has a rental of £31,264, the increase during the last twenty-five years being equal to over 7s. per acre of the total extent. As in Dunnottar, however, a pretty large part of the rental of Fetteresso is derived from the town of Stonehaven, which lies partly in the one parish and partly in the other. The principal estates in Fetteresso are Cowie, Fetteresso, Gillybrands and Newtonhill, Muchalls, Netherley, Urie and Rickarton. On all these estates pretty large sums have been expended since 1855 on various improvements, chiefly draining and building; while on all there has been less or more reclamation, mostly done in small pieces by the tenants. Since the beginning of the present century the arable area of this parish has been very largely increased, but the main portion of the reclamation took place prior to 1850. On the lower parts of the parish and along the coast towards Muchalls there is a good deal of medium fertile loam, that yields well under liberal management. On the more inland and higher parts, however, the soil is either mossy, or thin moorish loam, or cold clayey loam; the subsoil being moderately open in some parts, but in a large portion close and hard. Much as has been done in draining there still remains a good deal to be done. On the estate of Netherley there is a large tract of deep moss, from which in former times immense quantities of peat were cut and driven to Aberdeen, mostly by crofters and cottars on the property. The estate of Netherley was purchased close on twenty years ago for Mr W. N. Forbes from Mr Horatio Ross, the famed sportsman, for £53,000. Not very long before that time it was purchased for Mr Ross by the late Mr Walker, Portlethen, for £33,000. When in Mr Ross's possession the property was under the skilful management of Mr Walker, and was in many

respects considerably improved. About twenty years ago the Commonty of Cowie in Fetteresso, extending to about 2000 acres was divided among the proprietors interested, the superior, the proprietor of Dunnottar, getting about one-half. When divided most of the land was let in small lots to tenants on improving leases at a rent of 5s. per acre the first ten years, and afterwards about 10s. These tenants reclaimed the land partly by ploughing and partly by trenching; have drained it well and made it into moderately fertile land. The soil consists mostly of moorish loam and moss.

In the parishes of Banchory-Devenick, Nigg, and Maryculter, which form the north-eastern corner of the county, there is great variety of soil and an irregular stony surface. Along the coast there is a narrow fringe of good sharp loam, thin as a rule, and nowhere heavy, but generally sure and fertile. Within 7 or 8 miles of Aberdeen almost all the farms and a good many crofts are devoted to producing milk, butter, and eggs for Aberdeen; and in this way larger rents are paid than could possibly be taken out of the land by ordinary farming. In the Portlethen district, for instance, a rent of 30s. or £2 per acre is paid for land that in the centre of the county would not be worth more than £1 or £1, 5s. per acre. These parishes extend respectively to 7819, 4606, and 7923 acres. In Banchory-Devenick the increase in the rental since 1855 is not far short of 10s. per acre of the total extent. Nigg has increased by more than £1 per acre, but of that a large portion is due to feuing and building in the neighbourhood of Aberdeen. The increase in Maryculter exceeds 5s. per acre. In all these parishes there is a very large proportion of uncultivated land, so that these figures do not represent anything like the actual increase per acre of the arable land. Since 1850 there has been a large extent of land reclaimed, and a great amount of money expended on other improvements, such as draining, building, and fencing. One of the most extensive and systematic improvers in the county was the late Mr Dyce Nicol of Badentoy and Ballogie, M.P. Commencing in 1850 he spent a large sum every year for ten years, in reclaiming, draining, fencing, building, and road making; and thereafter till his death in 1872 he set aside one-fifth of the rental of the estate for permanent improvements. Since then his son, under the advice of his experienced factor, Mr George James Walker, Hillside House, Portlethen, has been maintaining the property in excellent condition, spending small sums on improvements now and again. The other larger properties in these parishes are Ardoe, on which Mr Ogston has expended a large sum on building, draining, and other improvements, and to which he has recently added the estate of Heathcot; Banchory, a very desirable property that has been greatly improved within the

past twenty-five years, and now owned by Mr John Stewart; Coul and Loirston; Altries; and Kingcausie. On the desirable little estate of Hillside, Portlethen, owned by Mr R. S. Kynoch Shand, there is some very good sharp loam, let in small holdings to industrious tenants, who devote the land to dairy farming and thus pay high rents. On the adjoining small property of Portlethen there is also some very fair land. The largest farm, the Mains of Portlethen, is leased by Mr R. B. Walker at a rent of £456, 6s. For the long period of forty-eight years this farm, and, for the greater part of that time, several other adjoining farms, were held by the late Mr R. Walker, one of the most enterprising and experienced agriculturists of his day. In addition to carrying on several arable farms, which he improved very greatly by reclamation, draining, building, and fencing, he managed with distinguished success during the greater part of his career as a farmer a large and well-bred herd of polled cattle, while he also, at the earnest solicitation of his many friends both among proprietors and tenants, devoted no little time to estate management and to the valuation of estates and farms. In the valuation of estates the benefit of his long experience and accurate knowledge was often solicited, and in many instances the fixing of the price between the buyer and seller of landed property was left entirely to himself. On the Kingcausie estate extensive improvements were carried out by the late Mr John Irvine Boswell; while the present proprietor has also improved the condition of the property. The largest estate in Maryculter is that of Altries, belonging to Mr Kinloch of Park. Towards the river Dee the soil is sandy loam, of moderate depth in some parts but generally light, while back from the river moss and clay predominate. The rent of the arable land averages about 20s. per acre. The extent under wood is about 364 acres, of which 60 acres were planted between 1865 and 1870 at a cost of £1, 2s. per acre. Between 1864 and 1878 about 90 acres of new land were reclaimed by trenching, draining, &c., at a cost of £11 per acre; while, since 1865, £2200 has been expended on farm buildings; £460 on the erection of 13,000 yards of stone dykes, 8½d. per yard; £825 in making 66,000 yards of furrow drains, £1, 5s. per 100 yards; £180 on 9000 yards of leader drains, £2 per 100 yards; and £110 in forming 2200 yards of roads, 1s. per yard. The total outlay on estate improvements during the past fifteen years has thus amounted to about £4900. Improvements have always been made under private arrangement between the proprietor and each individual tenant. Farms on this estate range from 30 to 400 acres in extent, there being sixteen crofts held under lease and rented at an average of about 25s. per acre. The five, six and seven shift rotations, with one green crop, are pursued, the

first being the most general. By far the largest farm on the Altries estate is Ashentilly, held by Mr James Duguid. Well laid off and efficiently fenced, with stone dykes, this farm has latterly been stocked mainly by sheep and dairy cows, for both of which it seems well suited. Though his farm is fully 10 miles from Aberdeen, Mr Duguid carries on dairy farming extensively and with success. The dairy produce is driven to Aberdeen every morning.

Proceeding westwards along Deeside we enter the parish of Durris, which extends to 15,435 acres, and has a rental of £9902. The increase since 1855 amounts to £3532, or close on 5s. per acre of the total area. Almost the whole of this parish belongs to Mr James Young, who about eight years ago purchased the extensive estate of Durris from the trustees of the late Mr A. W. Mactier, for the sum of £300,000. The estate extends to 16,659 acres, and yields a rental of £10,104. Mr Mactier expended a very large sum of money in reclamations, draining, fencing, and building, thus adding very largely to the value of the estate. A good deal of the land reclaimed by Mr Mactier was of a rough nature, and in some cases the cost was as much as £50 per acre. The soil consists mostly of loam of various texture, rich in some parts and thin and moorish in others; but the subsoil is for the most part cold damp clay, which has required close and thorough draining. The greater part of the estate; indeed, has been twice drained within the past thirty or thirty-five years; a good deal of it twice within the last twenty years, being done mostly by the proprietor, but partly also by the tenants. Since Mr Young obtained possession, he has expended a large sum on improvements of various kinds, particularly on planting, which he has carried out perhaps to a larger extent recently than any other proprietor in either of the two counties to which this report refers. The arable land is rented at about an average of 30s. per acre, the highest being £2 and the lowest £1. The rent of one farm let recently fell about 8s. per acre. On the whole, few estates are in a better condition as to houses, fences, draining, &c.; but, as is the case generally in these bad times, the tenants complain of rents being somewhat high. Near the side of the river Dee the soil varies from a light to a medium loam, all being fertile, sharp, and early. On the higher parts back from the river the soil is a trifle stiff, and the climate rather cold and late. One of the best farms on the estate is that of Nether Balfour, which is leased by Mr R. Salmond at a rental of £608, and managed with commendable skill and enterprise. The seven-shift rotation is pursued on this farm, wheat and potatoes being grown with success. Another admirably managed farm is that of Quithelhead, which is rented at £253 by Mr James Cowie Thom, whose system fairly illus-

trates that pursued in the district generally. Quithelhead extends to 173 acres, all arable, and to this a croft of 5 acres is added. The soil is mostly a yellowish loam, with clayey subsoil. Two-thirds of the farm was drained at 18 feet, and the remainder 36 feet apart. The five-course rotation is generally pursued, but many are now turning into the six-shift, which both lessens the labour and manure bills and diminishes the risk of damage to turnips by "finger and toe." Mr Thom would also prefer the six shifts, with three years grass, but his farm is laid off and fenced with stone dykes in five shifts, so that in six shifts the farm would be very inconvenient to work. Other farmers on the estate, and also on other properties in the two counties, have a similar difficulty to face in the altering of their system of cropping. Barley succeeds turnips on most farms, and yields from 4 to 5½ qrs. per acre, weighing 53 to 55 lbs. per bushel; oats yield from 4 to 7 qrs., weighing from 40 to 43 lbs.; potatoes from 5 to 6 tons; turnips from 13 to 17 tons; and hay about 200 stones of 22 lbs. each. Turnips and potatoes get from 12 to 18 loads of farmyard manure, with artificial manure, mostly guano, dissolved bones, bone dust, and coprolites, to the value of about 30s. or 40s. per acre. Sowing sometimes begins about the middle of March, and harvest occasionally as early as the second week of August. The latter, however, is often much later in commencing, and is sometimes not finished till the middle of October. Mr Thom keeps about forty-two or forty-five cattle of all ages. Formerly he fed off his cattle when rising three years, but now he finds it more profitable to feed them off a year younger. Those he has sold when two years old have brought from £23 to £24 a-head. A good deal of linseed and cotton cake is used. A good many cattle are bred in the district, but not nearly so many as are fed in it. A large number of Irish stock are bought in lean, and sold fat, after being kept for from six to ten months. The home-bred stock are far superior to these. Since he began to feed off his cattle when two year olds, Mr Thom has put his calves into the court their first winter, and has added to their allowance of straw and turnips a mixture of cake and bruised oats and barley. The proprietor lately built an addition to Mr Thom's steading in the form of sheds and feeding byre, the rent on this account being raised by £10. The farm is divided into fifteen fields, varying in extent from 10 to 14 acres, and the croft into five fields, all well watered and fenced by substantial stone dykes. Entry is obtained to farms on this estate at Martinmas, the first half-year's rent being payable a year afterwards. Since about 1850 the rent of the arable land has increased by about thirty per cent.

On the opposite side of the Dee from Durriss lie the parishes of Drumoak and Banchory-Ternan. Of the former, only 2121



acres are in Kincardineshire, the remainder being in the county of Aberdeen. Banchory-Ternan contains 19,256 acres, and yields a rental of £1409. The increase since 1855 amounts to £5259, or more than 5s. per acre of the total extent. The rent of this parish is largely swelled by the growing village of Banchory; while the average rate per acre is greatly decreased by a large area of uncultivated land. The principal estate in these parishes is that of Leys, owned by Sir Robert Burnett, Bart. of Crathes. This fine property extends to 12,105 acres—5200 under cultivation; 3509 (including the Hill of Fair, which extends to about 1700 acres, and is mostly covered by heath) under natural pasture; 241 of moss; and 3000 acres under wood; roads, &c., taking up 155 acres. The average rent of the arable land is about 18s. or 20s. per acre, the increase on the estate since 1855 being about £1100. Since 1850 very extensive improvements have been carried out on this property, all under the close and careful superintendence of the intelligent and practical proprietor and Mr John Davidson, North Leys, the factor on the estate. Between 600 and 700 acres of land have been reclaimed, partly by trenching and partly by ploughing, the cost, including draining and other work, being about £15 per acre. This work has been proceeding constantly during the past thirty years, so much being done every year. In the same way about 1500 acres have been planted, at a cost of about £3, 5s. per acre, exclusive of fencing and the clearing away of broom and whins, &c.; while on building throughout the estate about £700 has been spent yearly since 1850, including carriages, which were all performed by the tenants. The yearly expenditure during this period on fencing has been about £120, and on draining £180. The total expenditure on road making since 1850 has been about £150. In addition to the land reclaimed by the proprietor, since 1850 the tenants have reclaimed about 400 acres, mostly by ploughing, but partly also by trenching. The houses on the property are as a rule very good, and the land is fairly well fenced, mostly by good stone dykes. The soil is partly sandy, on a gravelly subsoil, and partly light loam, with a subsoil of clay and sand. On the higher portions there is a good deal of moss. The five and six shift rotations are pursued, the latter being now the most general. The farms vary greatly in size. There are six of 200 acres and upwards, sixteen between 100 and 200, and thirty-five between 40 and 100 acres. In addition, there are sixty crofts on the estate, ranging from 5 to 30 acres in extent, some being held, like the farms, under nineteen years' lease, and some under ten years' lease. As a rule the crofters pay higher rents than the farmers, the average on the crofts being about 24s. per acre. The cattle bred and fed on the estate are mostly crosses between

shorthorns and polled cattle, a few pure-bred animals of both breeds being raised in the district. The most important change in the system of farming on this estate within the past twenty-five years has been the more extensive adoption of the six-shift rotation. The stocks both of cattle and horses have been greatly improved during that period. On other estates in this parish there has also been a good deal done in the way of permanent improvements since 1855.

The last parish we visit is Strachan, the most western and by far the largest parish in the county. It extends to no less than 41,885 acres, the main portion of it consisting of high hills and moors. The rental is only £5210, the increase since 1855 being £1573. The arable area is very small, and is made up largely by a narrow irregular fringe along both sides of the Feugh and its tributary the water of Dye. Near the village of Strachan on the Feugh there is a considerable stretch of really good arable land, mostly black free fertile loam. The principal estates in this parish are those of Glendye, Strachan, and Blackhall. On the former, now owned by Sir Thomas Gladstone, Bart. of Fasque, there is a small strip of arable land along the course of the Dye, mostly between Binglyburn and Glendye lodge, a short distance above the bridge of Dye. On the Strachan estate there are a few good arable farms, the largest being Bowbutts. Extending to 180 acres, all arable, this farm is leased by Mr James L. Rust at a rent of £219. The soil is light black loam, on gravel or rock. One half the farm is worked in five shifts, and the other in the "easy" six-shift rotation. The five shifts is still the most general in the district, but the six is gaining ground. The latter is the most in favour everywhere, but some portions of the land would throw out the sown grasses and go back to the natural state, growing heath and rough grasses, if left three or more years in grass. Oats yield about  $4\frac{1}{2}$  qrs. on an average, and weigh 42 lbs.; barley,  $3\frac{1}{2}$  qrs., weighing 55 lbs.; potatoes,  $5\frac{1}{2}$  tons, suitable for the market; turnips, 18 to 20 tons; and hay,  $1\frac{1}{4}$  ton per acre. Turnips get from 10 to 12 loads of farmyard manure per acre, with from 3 to 5 cwt. of artificial manures. Potatoes get from 12 to 15 loads of farmyard manure per acre, with from 4 to 5 cwt. of light manures. The artificial manures mostly used for potatoes consist of a mixture of potash salts and other substances, and for turnips soluble and insoluble phosphates. Very little wheat is grown in this district, but oats and barley of heavy weights and very fine quality are raised. Harvesting begins, as a rule, early in September. A good many cattle, mostly crosses between the polled and shorthorn breeds, are reared in this parish. Indeed, a few of the smaller farmers breed more than they feed, while the larger farmers have only a few to buy in. Mr Rust and

some others allow their calves almost 1 lb. of linseed cake during winter, and for some time before they are finished as feeding cattle they get, in addition to turnips, a liberal allowance of cake, oats, and barley, bruised and mixed with bran. Since 1850 the stock bred and fed in this district have improved very greatly, mainly by the introduction of really good well-bred bulls, and by more attention being paid to the class of cows kept, and to the feeding and housing of cattle. Three years ago Mr Rust sold four cross stots of his own breeding, and under two years old, at an average of £35 each. One of these four, 1 year and 11 months old, weighed when killed, and after hanging in the slaughter-house for two days, no less than 9 cwt. 3 qrs. and 26 lbs., or only 2 lbs. short of 10 cwt. Mr Rust renewed his lease two years ago, and since then the proprietor has built new houses and executed several thousand yards of drains, the tenant paying interest on the outlay at the rate of 5 per cent., and also performing all carriages free. In this district generally the most of the land has been drained since 1850, either by Government, the proprietors' or tenants' money; while besides great improvement in the way of building and fencing, a large extent of new land has been reclaimed, chiefly from moor and moss. Rent varies from 20s. to 28s. per acre. On the Blackhall estate there are also some very good arable farms, managed in a manner similar to the system prevailing on the Strachan property. One of the largest and best managed holdings is the combined farms of Letterbeg and Bucharn, held by Mr James Leys. The extent is 245 acres arable, and 60 of natural pasture, the rental being £240, 11s. The soil is mostly black friable loam. A portion of the farm is put under sheep, and is broken up occasionally. The other portion is worked in five shifts. Barley and oats yield on an average about 4 qrs. per acre, the former weighing 54 and the latter 41 lbs. per bushel. Potatoes yield about 7 tons, turnips 18 to 21 tons, and hay 1½ ton per acre. In addition to a good dose of farmyard manure, turnips and potatoes get a mixture of artificial manure, mostly dissolved bones with a small portion of superphosphate of lime, to the value of about £2 per acre. During the last four years the proprietor has expended £1400 on this farm on trenching, draining, building houses, and erecting dykes, the tenant paying interest at the rate of 5 per cent., and also performing all the carriage free. The farm is well watered and fairly well fenced. The arable land in this district is rented at about 24s. per acre.

Mr Sim, the tenant of the farm of Gateside on the Strachan estate, has for a few years been growing strawberries to the extent of about 2 acres. The results have varied greatly with the seasons, but it is understood that on the whole the experiment has been successful. The yield and the price both seem

to be very irregular. This year as much as £27, 10s. per ton was obtained, and it is stated that occasionally the yield will reach close on 2 tons per acre. The labour bill, of course, must be a pretty heavy one. Around Banchory and elsewhere on Deeside there are smaller patches of land devoted to the raising of strawberries. The granite soil and dry climate seem to suit them admirably.

*Rent, Leases, Rotation, Size of Farms.*

*Rent.*—The rent of arable land varies with soil, climate, and situation, and as we have already seen there is great variety in these respects, in both Forfar and Kincardine. Near Dundee, it is as high as 120s. per acre, from 80s. to 100s. being general in that district. A few miles along the coast northwards it falls to about 60s., and then to from 40s. to 50s. Here and there along the coast there is a farm rented at about 35s. per acre, but all the better land reaches or exceeds 40s. On the slopes of the Sidlaw hills rent ranges from 20s. to 28s. per acre, a few farms being even higher and some lower. Throughout the valley of Strathmore it varies from 30s. to 50s. per acre, 38s. and 42s. being the most general figures for pretty good land; the average all over the vale would not exceed 35s. per acre. On the Braes of Angus it runs from 18s. or 20s. to 35s. or 38s., the average being under 28s. Around Brechin and on the north-eastern corner of the county, it varies from 30s. to 42s. per acre. In Kincardineshire rents are considerably lower, only small portions of the land here being rented for wheat and potatoes. Some of the best land in St Cyrus is rented at close on 60s., a good deal of it being over 40s. Along the coast between Bervie and Montrose it ranges from 28s. to 50s., the average being under 30s. On the Garvock slopes it varies from 18s. to 30s.; in the Howe of the Mearns from 28s. to 45s., the average being 30s. to 33s.; on the slopes lying up to the Grampians from 20s. to 25s.; in Glenbervie, Kinneff, Dunnottar, and Fetteresso, from 20s. to 30s., some farms being over 30s., and a few as low as 15s.; between Stonehaven to Aberdeen, from 20s. to 48s.; in Maryculter, Durris, Drumoak, and Banchory-Ternan, from 20s. to 38s., the general run being from 25s. to 30s.; and in Strachan from 15s. to 30s.; the average being 22s. or 24s. per acre. The increase since 1855 also varies greatly in different parts of the two counties. Near large towns the increase has perhaps not exceeded 12 per cent.; but in other parts where extensive improvements have been effected, it has amounted to 30 per cent. or more. The average increase in the two counties is as nearly as possible equal, and may be safely put at from 20 to 25 per cent. There is much speculation at present as to whether

or not rents will fall. The almost unprecedentedly bad weather of recent years, coupled with foreign competition both in grain and meat markets, has, naturally enough, disheartened Scotch farmers, and led many of them to take a somewhat gloomy view of matters. There is not the faintest risk of Scotch farming coming to a standstill. It must and will go on and prosper as before. We are not sure, indeed, but that foreign competition, and these times of adversity in regard to weather, which it may be hoped are merely temporary, will ultimately establish not only Scotch, but British farming generally, on a sounder basis than it has ever before been. There is no blinking the fact, however, that the large majority of farms let within the last two or three years have brought lower rents than were paid for them before. It is undoubtedly a fact that rents have got a decided check; and there is even prospect of their receding somewhat. Indeed, a landed proprietor in Kincardineshire, who has a practical and accurate knowledge not only of the agriculture of this county but of farming and business matters generally, gives it as his opinion that rents will fall about 10 per cent. The rent for sheep farms has risen since 1855 at about the same rate as that for arable land.

*Leases.*—The nineteen years' lease holds sway almost all over these two counties. There are a few "improving" leases of twenty-five or more years' duration; while on the Airlie estates the land is held under fourteen years' leases. Crofts are as a rule held from year to year, but in some cases under ten, fourteen, or nineteen years' leases. About ten or fifteen years ago "life" leases were pretty numerous in Forfar, the large majority being on the Panmure estates. The last, however, expired six or seven years ago. Generally speaking, few changes take place among the farmers of these counties, and only in exceptional cases do tenants remove from one estate to another. In Forfarshire the Martinmas term of entry to farms is the most general; Kincardineshire being almost equally divided between that term and Whitsunday. Where entry is obtained at Martinmas, the incoming tenant has, as a rule, to take over, at valuation by arbiters mutually chosen, one half or the whole of the growing crops of grain, and the whole of the turnip crop, but no potatoes or hay. The incoming tenant has to harvest the grain crops, but is paid for his work by the outgoing tenant. Tenants entering at Whitsunday usually take over at valuation all the grain crops, the grass, and dung. Rents are paid on almost all estates half yearly, the majority at Candlemas and Lammas,—the first half at Candlemas, fifteen months after entry. In a good many cases Martinmas and Whitsunday terms are the rent days. Forehand rents are the exception. On Mr Baird's estate of Rickartoh, in Kincardineshire, forehand rents have been paid from time immemorial by a considerable number of tenants—at

Candlemas before sowing, and Lammas before reaping. In some recent cases tenants have stipulated for breaks in their leases at the end of ten years or thereby, while in general a strong desire is being expressed for more freedom both in cropping and disposing of produce. On the highly rented lands near towns and railway stations, many tenants have already almost perfect liberty in these respects; while all over both counties farmers have more freedom in cropping than formerly. Mr Patrick Dickson, the factor on the Urie and Hallgreen estates in Kincardine, has introduced the following clause as to cropping into the leases of these properties; and having let several farms under it, he finds that it meets with the approval of the tenants:—"The tenant shall farm the lands well, and they shall be so cultivated that there shall never be two white crops taken from the same field in succession unless after three years old grass. Each field when not in white crop or grass shall be thoroughly cleaned and well manured. There shall never be more than two-fifths of the farm in grain crop, nor less than one-fourth in grass in any one year, and any field sown out in grass is to be cut only one year. No manure shall be sold off the farm."

*Rotation.*—A number of different systems of rotation is pursued throughout these counties. In the wheat and potato districts the six and seven shift systems prevail. The crops in the six shifts are:—first oats, second potatoes, third wheat, fourth turnips, fifth barley, and sixth grass partly cut and partly pastured. The seven-shift rotation includes a second year of grass. In some particular localities the six shifts are the most general, but taking the wheat districts as a whole the seven occupy the larger area and are gradually gaining ground. Near Dundee and other towns, some farmers work on eight shifts:—first grass, second oats, third potatoes, fourth wheat, fifth turnips, sixth oats, seventh potatoes, and eighth wheat with grass seeds. On the thinner soils the five and six shift systems with one green crop are generally pursued—two or three years grass, followed in succession by oats, turnips, and potatoes, and barley and oats, and perhaps a portion of wheat. Where the land and situation are suitable, and where the tenant has liberty to do so, a fifth, a fourth, a third, or even a half of the green crop break is put under potatoes, care being taken not to repeat potatoes on the same part of the shift when its next turn comes for green crop. On other farms where the soil is strong a portion of the green crop break is put under beans, cabbages, and tares, or one or other of these. On good soils some farmers work on the following seven shifts:—three years in grass, fourth oats, fifth potatoes, beans, vetches, and cabbages, and perhaps a portion a

second time under oats, sixth turnips, and seventh barley with grass seeds. Throughout both counties the five-course rotation is less popular than formerly, and many farmers are giving it up in favour of the six shifts which introduces a third year's grass. The latter lessens not only the labour and manure bills, but also, it would seem, the risk of damage by "finger and toe." If the land could be made to carry grass fairly well for three years, it is pretty evident that all the thinner varieties of soil, if not indeed also all medium soils, would be more profitable under the six than under the five-shift rotation.

*Size of Farms.*—Taken as a whole, these two counties are fairly well apportioned into large, medium, and small farms and crofts. In some districts, however, more particularly in the richer parts, there is a scarcity of crofts and small farms; while in others, usually on the poorer soils, there are rather too many holdings ranging from 20 to 40 acres. These latter holdings are somewhat large to be worked in twos by one pair of horses, and too small to be laboured singly with full advantage. Crofts and small farms are the best possible nurseries of farm labourers, and a scarcity of these holdings is therefore a misfortune to a district. The following tables show the number of holdings of various sizes in both counties:—

Counties.	50 acres and under.	From 50 to 100 acres.	From 100 to 300 acres.	From 300 to 500 acres.	From 500 to 1000 acres.	Total.
Forfar	1437	405	666	166	34	2708
Kincardine	1081	308	370	39	8	1806

The holdings under 50 acres were stated in 1870 to number 1399 in Forfar, and 1210 in Kincardine; while in that year these were classed as follows:—

Counties.	Not exceeding 5 acres.	From 5 to 20 acres.	From 20 to 50 acres.	Total.
Forfar	479	583	337	1399
Kincardine	424	513	273	1210

In Forfar, in 1875, the percentage of holdings under 20 acres in extent was 41; above 20 and under 100 acres, 27; and above 100 acres 32. In Kincardine the corresponding figures were

50, 29, and 21. In the first of these three classes of holdings, Forfar stands nineteenth in Scotland, in the second seventeenth, and in the third thirteenth. Kincardine stands respectively, twelfth, fifteenth, and nineteenth.

*Buildings, Drains, Fences, and Roads.*

*Buildings.*—The extensive improvements effected on the leading properties since 1855 in the way of building, draining, fencing, and road making, have already been fairly well indicated, and therefore, to say much more here would be superfluous. As to building, it may safely be said that few counties have made more rapid progress within the last twenty-five years than Forfar and Kincardine. On many estates in both counties the farm buildings were pretty good long before 1855, but on the majority of properties they were decidedly behind the age, not so much perhaps in size as in comfort and convenience. Every year of the last twenty-five, however, has witnessed improvements on all hands, and so, perhaps, will every year for some time to come. As leases expire proprietors either erect new steadings, or enlarge, improve, and modernise old ones. The tenant in all cases performs the carriages free of charge, and sometimes also pays a certain percentage on the outlay. The more general custom now, however, is for the proprietor to erect houses under an arrangement as to rent agreed upon when the tenant enters the farm. In almost all cases where new steadings are built, large wholly or partially covered cattle courts are provided, while these valuable erections invariably form a prominent feature in improvements effected on old steadings. The majority of farmers seem to favour wholly covered courts, but still a good many skilful men prefer them partly open. In both counties there are still a good many old-fashioned inefficient steadings, without covered courts, and many other conveniences that characterise new farm offices, but these are gradually disappearing. In farm dwelling-houses, too, there has been great improvement since 1855; and, generally speaking, both counties are fully abreast with the times in this as in most other respects. In Forfarshire, in particular, there is a large number of farmers' residences almost mansion-like, both in dimensions and in surroundings. Few counties have so many resident proprietors. They are indeed very numerous, and therefore, as might be expected, there are in these counties a great many gentlemen's seats, many of them imposing mansions, embosomed in beautiful policies. The houses of crofters and small tenants are, comparatively speaking, not as a rule equal to those of larger farmers, but in these also there has been great improve-



ment since 1855. The supply of labourers' cottages is not yet complete, but it has been increased largely within the last twenty-five years. It is now rather better than in most other counties north of Perth. In driving threshing-mills, water is used wherever it can conveniently be obtained; but still, on a very large number of farms, steam has to be employed.

*Drains and Fences.*—As indicated in the notes of our supposed tour a very large sum of money has been expended in these counties since 1850 in the draining and fencing of arable land. In the former, in particular, a great deal has been done in both counties, not only in the draining of new land but also in the re-draining of old land. As in the case of buildings, less or more draining is usually arranged for at the beginning of leases, tenants always performing carriages and generally also paying an increased rent or a certain percentage of interest, generally 5 per cent. In addition, however, to what has been done in this way by proprietors, the tenants have themselves since 1855 effected a very large extent of drainage. On the whole, it may be said that both counties are now pretty well drained; but in some localities still further drainage would considerably improve the quality and value of the land. Tiles are now used for the most part. Though a great deal has also been accomplished in fencing within the last twenty-five years, these counties are probably further behind in this respect than in any other. The Deeside districts of Kincardineshire are well fenced, mostly by substantial stone dykes erected by the proprietors since about 1845 or 1850; while there are also some other parts of this county and some portions of Forfar very fairly supplied with fences,—partly dykes and hedges, but mostly wire,—but taking the lower districts of the two counties as a whole, they are greatly deficient in permanent fencing. Both proprietors and tenants seem more than ever alive to the great advantages of sufficient fencing on a farm, and there is every reason to believe that the want in this respect will speedily be supplied. A very large extent of fencing is being erected every year.

*Roads.*—Both counties are exceptionally well provided with roads—alike with farm, district, and county roads. Probably nowhere in Scotland are the roads more easily maintained or of better quality than in Kincardineshire, while Forfarshire is but very little, if any, behind in this respect. The cost of maintenance, charged against the county rates is below the average in Scotland generally. Indeed, in some parishes in Kincardineshire, it does not exceed 3d. per £1—1½d. on proprietors, and 1½d. on tenants and occupants. The turnpike roads of Forfarshire are over 190 miles in length.

*Grain Crops.*

The following table shows the number of acres under all kinds of grain crops at various times since 1854:—

	Forfar.	Kincardine.
1854, . . . .	90,190 acres.	40,872 acres.
1870, . . . .	92,173 "	45,183 "
1875 . . . .	96,089 "	46,100 "
1880, . . . .	94,793 "	44,936 "
Increase in Forfar since 1854, . . .		4603 acres.
Decrease " 1875, . . .		1296 "
Increase in Kincardineshire, since 1854,		4064 "
Decrease " " 1875, . . .		1164 "

It will be seen that both counties increased rapidly in the area under grain from 1854 to 1875, the comparative increase being greater in Kincardine than in Forfar. In common with most other counties in Scotland these two show a decline in the corn area during the last few years, the decrease in this respect being represented by a more than corresponding increase in the extent under grass. The percentage of the total area of Forfar under corn crops in 1870 was 16·2, and this year 16·6, which places this county eighth in this respect in Scotland. The percentage in Kincardine in 1870 was 18·2, and this year 18·1, which places it fifth. In the Board of Trade returns the counties of Scotland are classed as "pastoral," "corn," and "mixed" counties. Forfar and Kincardine are ranked as "corn" counties; and among these, which also include Aberdeen, Banff, Berwick, Elgin, Fife, Haddington, Nairn, Orkney, and Ross and Cromarty, Forfar stands sixth as to its percentage under corn, while Kincardine ranks fourth, Fife coming first with 26·4, Haddington second with 25·3, and Berwick third with 21·6. As to the yield and quality of grain these counties hold their own pretty well with Scotland generally. In the better parts of Forfarshire a great deal of very fine wheat is grown; while, in both counties, barley and oats of the very best quality are produced. The variable climate makes considerable difference in the times of sowing and of harvesting between the higher and lower districts. Wheat is sown as soon as possible in the autumn and winter, and the other varieties as soon after the middle of March as the state of the land and weather permit. Most of the grain is now sown by machinery. Drill machines are used almost exclusively in some of the earlier parts, and with these very small quantities of seed suffice, thin sowing being largely practised in Forfarshire. In the earlier parts harvest commences between the 10th and 31st of August, and in the later districts between the 1st and middle of Sep-

tember. Cutting is almost wholly performed by reapers, and has been so for several years. It may be interesting to note that the original inventor of this now indispensable farm implement—the Rev. Mr Bell—was a native of Forfarshire, and that his invention was first tested publicly on the farm of Powrie near Dundee. It may also interest and, perhaps surprise some to know that in parts of Forfar the reaper succeeded directly to the old-fashioned hand hook, the intermediate scythe never having been adopted. The work of the harvest is pushed on with great energy, and often finished in a very short space of time, sometimes, indeed, in less than a month. On one large farm in Strathmore last season 200 acres were cut in ten days with two reapers. The cost of harvesting is usually reckoned at from 17s. to 20s. per acre. Taking all the varieties together, exclusive of beans and peas, the value of the grain crop in Forfar may be estimated at about £8 per acre. In the better localities it is of course considerably higher, but making full allowance for the falling off in the later and poorer parts, this figure pretty nearly represents the average value.

The following table shows the average fiars' prices for the different varieties of grain in both counties from 1872 to 1878, both inclusive:—

	Forfar.		Kincardine.	
	s.	d.	s.	d.
Wheat, . . . . .	41	8 $\frac{3}{4}$	40	10
Barley, . . . . .	31	2	30	6
Bear, . . . . .	29	6	28	10
Potato Oats, . . . . .	24	11 $\frac{3}{4}$	25	4
Common Oats, . . . . .	24	5 $\frac{1}{2}$	24	5
Peas and Beans, . . . . .	37	6 $\frac{1}{2}$	36	6
Oatmeal, . . . . .	20	0 $\frac{3}{4}$	19	1
Rye, . . . . .	25	11 $\frac{1}{2}$		

### *Wheat.*

The area under wheat at various times since 1854 was as follows:—

	Forfar.	Kincardine.
1854, . . . . .	12,795 acres.	2327 acres.
1870, . . . . .	13,705 "	1130 "
1875, . . . . .	12,573 "	1063 "
1880, . . . . .	9,072 "	491 "
Decrease in Forfar since 1854, . . . . .		3723 acres.
"    Kincardine    "    . . . . .		1836 "

These figures show a very large decrease in the production of wheat, and indicate clearly that cultivation of this variety of grain is not nearly so profitable as formerly. It may have been that ten or twenty years ago wheat was grown on land or at an

elevation not suited to it. To some extent at least, we think that had actually been the case. By a liberal enough estimate, the extent of land in Forfarshire calculated to suit the cultivation of wheat, has been stated at 70,000 acres. Under the six-shift rotation this would give 11,555 acres of wheat every year, or 2150 less than the area under wheat in 1870, and 2483 more than that last season. The extent in Kincardineshire considered adapted to wheat is about 4000 acres, which, under the seven-shift rotation, the most general system in the wheat growing farms of Kincardine, would give barely 600 acres of wheat every year. The falling off in the area, however, is due mainly to other causes, chiefly foreign competition and a decrease in the yield per acre. There is no doubt that the reduction in the average price of wheat, caused by foreign competition, has more to do with the decrease in the area under wheat than any other influence; but it is equally certain that the profits from wheat have in some degree been curtailed by a slight but pretty general falling off in the yield per acre. It is the belief of most farmers, whose experience of wheat growing extends as far back, that compared with about 1850, the yield of wheat now is less by from 2 to 3 or 4 bushels per acre. This need hardly be matter for surprise, for although farmers now, as a rule, manure their land very liberally, they are, with very few exceptions, groping under a somewhat dull light, if not altogether in the dark, in the nourishing of their exhausted land by chemical preparations. It is clearly seen that continuous wheat growing cannot be accomplished with anything like success unless conducted by those having an intimate knowledge of chemistry; and for the same reasons it follows that prolonged wheat growing in a rotation cannot be carried on with undiminishing success without the aid of chemistry. Farmers are gradually becoming more and more alive to the importance of having a knowledge of at least the elements of the science of agriculture; but unfortunately few of them have within their reach the means of obtaining such knowledge. If our mixed system of husbandry is to continue to flourish as it has done in the past, it would seem to be absolutely imperative that farmers should be armed with the powerful aid of science. It would be well for the country if education on all branches of science bearing on agriculture were within the reach of every young man who intends to make farming his profession. But we must not digress further. The yield of wheat in an ordinary year ranges from 3 to 5 qrs., weighing from 60 to 62 lbs. per bushel. The average would perhaps be about 28 or 30 bushels per acre. The average yield of straw would be about 40 stones per qr., worth say 14s. Taking the average yield of wheat at 30 bushels, and the price

at £2, 2s. 9d. per qr. (the average of the fiars' prices for the ten years ending 1878), the total value of an acre of wheat would be about £9, 16s. 3d. Wheat generally follows potatoes in the rotation, and is sown as soon as possible after that crop has been got out of the land, between the end of October and 1st of January. The coarser varieties are more extensively grown now than formerly. Little of the Fenton variety is grown now compared to what was at one time. Clubhead and other red varieties are more in favour. The amount of seed given ranges from 2 to 4 bushels per acre. Forfar stands second in Scotland, next to Fife and Haddington, in regard to the area under wheat. Kincardine ranks eighteenth.

### *Barley.*

The extent under barley at various times since 1854 is shown in the following table:—

		Forfar.	Kincardine.
1854,	. . . .	25,222 acres.	7,815 acres.
1870,	. . . .	26,416 "	11,032 "
1875,	. . . .	30,096 "	12,743 "
1880,	. . . .	31,604 "	12,233 "
Increase in Forfar since 1854,		. .	6382 acres.
" Kincardine "		. .	4418 "

The figures show an increase of more than double the decrease in the area under wheat. The counties of Fife and Forfar are by far the largest barley growing counties in Scotland. They usually have about the same acreage under this variety of grain, but this year Forfar has the advantage by about 1500 acres. Kincardine stands ninth. On the whole, barley is perhaps the most profitable variety of grain grown in these counties. Along with potatoes it is undoubtedly the mainstay in Forfar, and also in the earlier and better parts of Kincardine. Where so much feeding is carried on as in these counties, a large supply of good straw is indispensable; and there is no doubt that, but for the coarse quality of its straw, a much larger area would be put under barley than at present. The yield of barley varies from 4 to 6 qrs., the average being between 36 and 40 bushels per acre. The weight per bushel ranges on an average from 50 to 54 lbs., 56 lbs. being frequently reached. The general quality of the barley grown in these counties is undoubtedly very high. Since 1850 the yield of barley has increased by from 4 to 8 bushels per acre, which has been brought about by the more thorough draining of the land, the use of more artificial manure and feeding stuffs, and by better

cultivation. From each quarter of barley there would be about 20 stones of straw, worth perhaps 11s. The average price of barley for the ten years up to 1878 was 30s. 9d. per quarter. Supposing 36 bushels were the average yield, the total value realised from an acre of barley would be about £9. Barley is grown on most farms after turnips, and is sown between the middle of March and end of the first week in May. From 2 to 4 bushels of seed is allowed to the acre. A very large proportion of common barley is grown, but most farmers sow a portion of Chevalier, Cheyne, or some similar variety.

*Oats.*—The following table shows the acreage under oats at different times since 1854:—

	Forfar.	Kincardine.
1854, . . . .	50,995 acres.	29,451 acres.
1870, . . . .	50,623 „	32,187 „
1875, . . . .	51,077 „	31,273 „
1880, . . . .	53,161 „	31,630 „
Increase in Forfar since 1854, . . . .		2166 acres.
„ Kincardine „ . . . .		2179 „

In Forfar there has been less alteration in the area under oats than any other crop during the last twenty-five years. Indeed, until within the last five years, it had scarcely increased any. In Kincardine there has been a pretty gradual and rather more rapid increase. The greater area under oats is due more to the reclamation of new land than to its substitution for any other crop. Forfar stands fourth and Kincardine fourteenth in regard to the extent under oats, Aberdeen coming first and Banff second. The yield of oats varies greatly, ranging from as low as 3 to as high as 9 qrs. per acre. The average would probably be from 36 to 46 bushels per acre. The weight per bushel averages from 40 to 43 lbs. On the better land much higher weights are often obtained. From 8 bushels of oats the yield of straw would be about 24 stones, worth from 12s. to 15s. The average price of oats for the ten years ending 1878, was £1, 4s. 8d. per qr. The total value thus obtained from an acre of oats, that yields 46 bushels, would be about £10, 9s. 10d. Oats are grown mostly after lea, but also largely after turnips, and in some cases after potatoes. The quantity of seed varies from 3 to 6 bushels per acre. They are sown between the middle of March and the end of April. The varieties most largely grown are Early Angus, English Birley, Sandy, Potato, Black, Pedigree, and other newer varieties.

*Rye, Beans, and Peas.*—The area under rye since 1854 has been exactly tripled in Forfar, the extents being 111 and 333 acres. It has increased in Kincardine from 62 to 82 acres. Beans are

grown pretty largely on some farms, but there is little change in the area under them since 1854. The extent in Forfar that year was 690, and last season 605 acres. In Kincardine the area in 1854 was 474, and in 1880 464 acres. In Forfar there were 138 acres in 1854, and 18 in 1880 under peas; and in Kincardine 77 acres in 1854, and 36 last season.

*Hay, Grass, and Permanent Pasture.*

The following table shows the area of hay and grass under regular rotation in various years since 1854:—

	Forfar.	Kincardine.
1854, . . . .	77,349 acres.	36,961 acres.
1870, . . . .	73,872 "	41,288 "
1875, . . . .	74,959 "	45,824 "
1880, . . . .	81,396 "	46,134 "
Increase in Forfar since 1854, . . . .		4047 acres.
" Kincardine " . . . .		9173 "
" Forfar 1870, . . . .		7524 "
" Kincardine " . . . .		4846 "

It will thus be seen that latterly a greater extent of land has been allowed to lie longer under grass than ten years ago. This is due mainly to the increase in the cost of labour, and to the fact that experience has shown that turnips are less liable to damage from "finger and toe" when the land is worked in the six-shift rotation, which includes three years grass, than in the five-shift system, in which there are only two years grass. The increasing of the area under grass also helps to lessen the manure bills, which, of course, is also an important consideration. Near the larger towns in Forfar the grass land is mostly preserved for cutting, a ready sale and high price being obtained from cowfeeders for all the hay and fresh grass the farmers can raise. For this purpose at least three crops are got in one season. Throughout both counties a pretty large quantity of hay is made, though not so much, in comparison with the area under grass, as in some other counties. The yield of hay ranges from  $1\frac{1}{2}$  to 2 tons, the average on well managed farms being about  $1\frac{3}{4}$  ton, worth about £4 per ton or £7 per acre. The greater part of the grass land is sown out with barley. In the districts too high and late for barley the grass seeds are sown with oats. The mixture of grass seeds sown varies greatly. It usually includes from 16 to 22 lbs. of rye grass and from 6 to 10 lbs. of different kinds of clover seeds per acre. Forfar stands fourth and Kincardine eleventh in Scotland in respect to the area under grass in rotation.

In both counties there is a pretty large extent of permanent pasture or grass not broken up in rotation, exclusive of heath or

mountain land. The area in Forfar has increased from 27,225 in 1854 to 27,719 acres this year. In Kincardine the extent has decreased from 13,029 in 1854 to 5797 acres in 1880.

### *Root Crops.*

*Turnips.*—The extent under turnips at various times since 1854 was as follows:—

	Forfar.	Kincardine.
1854, . . . .	32,198 acres.	16,087 acres.
1870, . . . .	32,881 "	19,214 "
1875, . . . .	34,782 "	19,398 "
1880, . . . .	34,051 "	18,401 "
Increase in Forfar since 1854, . . . .		1853 acres.
" Kincardine " . . . .		2314 "

It will be seen that the area under turnips in both counties had increased gradually up till a few years ago, and that latterly it has been falling off somewhat. This is no doubt mainly due to a large breadth being put under potatoes since 1875, and to a still greater increase in the area under grass. As previously noticed, many of the wheat growing farmers have recently been altering from the six to the seven shifts, mainly with the view of lessening the labour and manure bills, and of avoiding damage to turnips from "finger and toe." In the parts where wheat is not grown a large number of farmers are, with the same view, giving up the five shifts in favour of the "easy" six with three years grass. These changes, at the same time, involve a decrease in the area under turnips. In regard to the area under turnips Forfar ranks second, and Kincardine ninth in Scotland, Aberdeen being the highest by nearly 60,000 acres. Generally speaking, the turnip crop in these counties is both heavy and of excellent quality, though perhaps barely equal in either respect to the famous crops grown on the granite soils of Aberdeenshire. The yield varies from 14 to 30 tons per acre. Even as many as 36 tons are grown sometimes. The average would perhaps range from 16 to 18 tons. Calculating from the prices obtained within the last eight or ten years, the average value, if sold to be consumed off the farm, would be about £1 per ton or £16 to £18 per acre, less the cost of lifting and conveying to the nearest railway station. If consumed on the land by sheep, the price obtained ranges from £7, 10s. to £11, 10s. per acre. If consumed on the farm by cattle the price varies from £8 to £14. Swedes bring from 15s. to 30s. more per acre than yellows. Near the larger towns very high prices are generally realised from the cowfeeders, most farmers in these parts having liberty to sell all the produce off their farms. In the



neighbourhood of Dundee as much as £22 per acre is very frequently obtained. The cost of growing an acre of turnips, of course, varies with the rent of the land, the amount of manure given, and other circumstances.

The report of the judges in the turnip competition in connection with the Stormont Union Agricultural Association (1880) has just been issued. The results are as follows:—1st, Mr Playfair, Coupar Grange, weight per acre 23 tons 15 cwt. 1 qr. 21 lbs.; 2d, Mr Smith, Drumbeltie, weight per acre 23 tons 6 cwt. 2 qrs. 21 lbs.; 3d, Mr Tasker, East Camno, weight per acre 23 tons 3 cwt. 2 qrs. 4 lbs.; 4th, Mr Buttar, Corston, weight per acre 23 tons 3 cwt. 0 qrs. 12 lbs. The number of turnips in each acre on the successful farms is stated at from 20,747 on Mr Buttar's fields, to 21,940 on Mr Smith's. The manure given for turnips varies from 10 to 20 tons of farmyard manure per acre, with a mixture of artificial manure, consisting of guano, dissolved bones, or bone meal, and a little superphosphate of lime and potash, amounting in value to from £2 to £4 per acre. In some cases where most of the farmyard manure is given to potatoes, the yellow turnips get nothing but artificial manure. Coprolites are being tried to a limited extent. At Balhousie, Mr Cowe has been specially successful both in the growing of turnips and potatoes. For turnips he gives from 12 to 15 loads of farmyard dung per acre, with the following mixture of 10 cwt.—2½ cwt. of guano, 1½ cwt. of bone meal, 4 cwt. of crushed bones, and 2 cwt. of dissolved bones. Turnips are sown between the 10th of May and middle of June, some even later. A very large proportion of swedes is now grown, a small quantity of soft varieties being sown for early use. A great portion of the turnip crop is consumed every year by sheep, mostly on the turnip field, but partly also on grass fields. Many farmers store the greater part of their turnip crop in good time, but still, as a rule, too little attention is given to this. The turnip crop is, with the exception of potatoes, the most costly one grown, and yet, many farmers leave their turnips exposed to the whole winter's frost.

*Potatoes.*—The area under potatoes at various times since 1854 was as follows:—

	Forfar.	Kincardine.
1854, . . . . .	12,529 acres.	2645 acres.
1870, . . . . .	16,723 "	3135 "
1875, . . . . .	14,607 "	2784 "
1880, . . . . .	18,303 "	3847 "
Increase in Forfar since 1854, . . . .		5774 acres.
" Kincardine " . . . .		1202 "

Forfar stands third and Kincardine fourteenth in Scotland in

regard to the area under potatoes. Perth comes first with 21,414, and Fife second with 18,640 acres. It will be seen that within the last five years there has been a very large increase in the area under potatoes. Of all the crops grown this is by far the most costly.

In some seasons the cost of the seed amounts to as much as £5, 10s., and in others it might not cost more than £3. There is no doubt that potatoes is the most speculative crop grown by farmers. It is uncertain alike as to yield and value. In a good year as many as 10 and 12 tons will be lifted on well managed farms, while in other seasons on the same land the yield may be less by a half or three-fourths. In a pretty good season a fair average for both counties would be  $5\frac{1}{2}$  or 6 tons per acre, while it may be reduced by one-half or more by a short period of unfavourable weather, or, indeed, rendered of very little value by disease. Prices again vary from £2 to £10 per ton. It often happens, as this year, that when a full average yield is obtained, and when there is little or no disease, the price is so small, under £3 per ton, that the crop cannot be disposed of to advantage. The average yield this year would perhaps, be about  $6\frac{1}{2}$  or 7 tons; but the price as yet being under £3 per ton, the whole yield of the two counties, if sold just now, would do little if anything more than meet the actual outlay in its production. On some farms, however, the yield reaches as much as 10 or 12 tons, and in these cases from £30 to £40 per acre will be realised. Last year the average yield was barely one-half of what it is this year, and yet the price was so much higher that the crop, taken as a whole, was worth more money than this year. For a crop of barely one-half the weight of this year's crop, some Forfarshire farmers last year obtained no less than from £45 to £48 per acre. A large farmer near Montrose pointed out a field on his farm to us which, the one year it was under potatoes, had brought him £60, and the other over £1000. When disease breaks out, and it has occurred very frequently in recent years, the price for sound potatoes rises so rapidly and to so high a point, that those who are fortunate enough to escape the disease obtain something like a windfall. It is doubtful if, during say the last two rotations, or ten or twelve years, potatoes have been on the whole a paying crop. Most farmers, who have long experience with them, say they have not. The speculative element, however, is no doubt a charm to some. It would seem that each hopes that he may be one of the fortunate few destined to have a large and sound crop in a year of disease. The wheel of fortune has undeniable attractions to many. There is no doubt that during

the last few years, when almost all other sources of profit to the farmer would seem to have for the time become dry, potatoes, wherever they have been extensively grown, have proved a most important mainstay. Last year, in Forfarshire for instance, some farmers, who had little or no grain to sell and made small profits from stock, realised so much for potatoes that after all the year, most calamitous as it was to British farming generally, was to them a profitable one. Another point in favour of the crop is that it is an excellent preparation for wheat, which is, in almost all parts suited to it, grown after potatoes. In Kincardine only small patches of potatoes are grown. Potatoes require liberal manuring, and also run up a very heavy bill for labour. The expense of planting is being lessened by the adaptation of mechanical appliances, but as yet planters have not come into general use. Diggers, however, are to be found on every potato farm. From fourteen to fifteen loads of farmyard manure are allowed to the acre, with only a little artificial manure in some cases, but in general a mixture costing from 25s. to 75s. per acre. A few farmers give even more than this. The light manures most generally used for potatoes are guano, bones, superphosphates, and potash. The farmyard manure is found to be more efficacious in the case of the potato crop when driven straight from the court to the drills, than when it has lain on the field for a time. In general potatoes are grown after oats; but in some cases they follow lea, and in these latter instances they often receive nothing but artificial manure, of which they get a mixture costing from £4 to £5 per acre. Some farmers spread the dung on the stubble field, and plough it in during the autumn and winter, but the majority apply it in the drills in spring. Many farmers are using less artificial manure for potatoes than formerly, believing that forcing by light manures increases the liability of the crop to fall a victim to disease. Potatoes are planted as early in the spring as is convenient. About one-half ton of seed is allowed to the acre. The varieties most largely grown are champions, regents, and Victorias. The crop is lifted as early as possible in October. Sometimes it is sold before being lifted, either by the ton or the acre. When the price is low, as it is this year, many store potatoes in pits, and wait in hopes of an improvement in the state of the markets. A pretty large quantity of potatoes are given to stock when they are cheap or damaged by disease.

*Other Green Crops and Fallow.*—Under other varieties of green crop last season there were 1085 acres in Forfar, and 414 in Kincardine. Mangold 7, carrots 37, cabbage, kohlrabi, and rape 66, vetches, &c., 975 acres in Forfar—and carrots 28, cabbage, &c., 15, and vetches, &c., 371, in Kincardine. The area under

these crops in Forfar in 1854 was 835, and in Kincardine 218. Vetches are used mostly in assisting to feed the cattle stock when the grass begins to fail. Only a small area is left under bare fallow. The extent in Forfar was, in 1854, 623, and this year 694 acres; the figures in Kincardine being 319 and 141.

*Cattle.*

The following tables show the number of cattle of different classes in the two counties at various times since 1854:—

FORFAR.

Year.	Cows or heifers in milk or in calf.	Two years old and upwards.	Under two years.	Total.
1854 . .	11,816	25,459	10,728	48,003
1870 . .	11,704	14,895	18,048	44,647
1875 . .	11,965	17,521	21,105	50,591
1880 . .	11,685	15,251	19,368	46,304

Decrease in total since 1854, 1699.

KINCARDINE.

Year.	Cows or heifers in milk or in calf.	Two years old and upwards.	Under two years.	Total.
1854 . .	6616	12,477	6316	25,409
1870 . .	7099	7432	12,627	27,158
1875 . .	7129	7832	15,096	30,057
1880 . .	6736	5595	12,876	25,207

Decrease in total since 1854, 202.

In the returns of 1854, the class "Under two years" comprises calves only.

It will be seen that the number of cattle in Forfarshire twenty-five years ago, was considerably greater than now. This is mainly due to the dreadful manner in which rinderpest devastated the herds in that county in 1865-66. To recount the progress of that terrible scourge would perhaps serve no good end. Suffice it to state that wherever it appeared it swept away almost every animal of the cattle tribe, dealing out ruin to many a man who would otherwise have been in comfortable circumstances. It also spread into the Mearns and some other parts of Kincardineshire, but this county, as a whole, suffered less severely than its neigh-

bour in the south. There is no doubt that it gave a very serious check to the agriculture of Forfarshire, more particularly to rearing cattle. Had not many of the landed proprietors come forward and very generously subscribed to help the more necessitous to tide over the sad calamity, the consequences might have been even more serious than they were. Apart from their pecuniary loss, many even of the more spirited farmers were so discouraged by the destruction of their fine stock, that for years they were unable to set to work in thorough earnest to replace what had been so ruthlessly swept away. At last, however, this feeling, and in most part also the pecuniary loss, would seem to have been got over, for the farmers in Forfarshire and the Mearns have for several years been devoting themselves, with all their wonted energy and success, to rearing and feeding cattle. In the former the lost ground has not yet been wholly made up, but there is reason to believe that the increase in the next ten years will be greater than in the last. The recent rapid growth of the herds of polled cattle will be afterwards noticed.

In dealing first with the ordinary farm stock, we may state at the outset that, in the system of breeding, rearing, and feeding, there is hardly any difference between the two counties. In neither the one nor the other is breeding pursued quite so largely as some twenty-five years ago. Latterly, it has been on the increase, but still it may safely be said that too few cattle are bred in both counties. There can hardly be any doubt that with freedom from disease, breeding would pay fully as well on the higher lying and lighter soils as would either feeding entirely, or partly feeding and partly breeding. In the later districts at present a good many farmers keep a breeding stock, and sell off their surplus cattle in lean condition either as yearlings or two-year-olds, the buyers being generally farmers in the neighbouring districts. A much larger number keep partly a breeding and partly a feeding stock. These breed from one-fifth to one-half of the number of cattle they feed and buy in the remainder at sales or markets. The great body, however, of the farmers of both counties keep only as many cows as supply the farm with milk, and perhaps rear from eight to twelve calves. On many large farms, indeed, not more than three, four, or five calves are reared. The total number of cows in each county is about equal to five for every holding above five acres in extent, and on a very large number of extensive farms the actual stock of cows kept does not exceed that. The general custom is to buy in lean stock either in spring, summer, or autumn, and feed them off during the winter and spring months. The majority are bought in when from fifteen to eighteen or twenty months old,

and, being fed off in six or eight months, are thus little more than two years old when slaughtered. Some farmers prefer older cattle, and either keep the cattle they buy in for two seasons, or buy in two-year-olds and feed them off when a little over three years. About twenty years ago very few cattle were fed off at so early an age as two, but now the majority of farmers prefer animals that suit this rapid system of feeding. By far the greater number of the home-bred cattle, which are superior to those bought in, are sent to the butcher when from two to two and half years old, while on the other hand the majority of those bought in are not fed off till about three years old. The large majority of the bought in stock come from Ireland, and are nearly all shorthorn crosses. They are usually large for the price paid, but they are often rough, and are frequently so badly used in the journey from their native isle to their ultimate destination, that they take some time to recover. They are, as a rule, in every respect inferior to the home-bred cattle, but they are very often the only class of cattle to be had. They are brought over by Irish dealers, from whom the farmers in these counties buy them either in markets or at sales, generally the former. Latterly a few farmers have been trying Canadian cattle, which are being sold regularly in Glasgow in large numbers. They are large, but rough and old. They are bought at small figures, however, and those who have tried them say they have paid well. A few Caithness crosses have also been brought into Kincardineshire for several years, while from England and even the eastern states of the European Continent, occasional lots are introduced. The extent of grass is limited in the wheat-growing districts, and a very large number of the bought in cattle do not enter the counties till well through the summer and in autumn. Generally speaking, the home-bred stock consist of crosses between either pure-bred shorthorn or polled bulls and cross cows, the latter being in most cases crosses between these two valuable breeds. There is no doubt that since 1855 the ordinary cattle-stock, taken as a whole, have improved greatly, partly from the more general use of well-bred bulls, partly from more careful selection of cows, and partly also from better housing and feeding. The early maturing properties of cattle have received more attention latterly than some twenty years ago, with the result that home-bred cattle are generally fed off a year sooner than formerly.

There is so little variety in the system of feeding pursued, that a few sentences will suffice on this point. On the large majority of farms, cattle get no artificial food on the fields in summer so long as grass is plentiful, but as soon as it begins to fail they receive supplies of green food, such as tares, either on

the fields or in the courts. Then during the greater part of the winter they (we refer to cattle being prepared for the butcher) are fed solely on turnips and oat-straw or hay, getting for about six weeks or two months before being sold a liberal supply of cake, linseed, or cotton, or a mixture of both, perhaps with the addition of bruised oats and barley. That is by far the most general system. Others, however, feed much more rapidly, giving a supply of cake or bruised grain, or both, during the greater part of the grass season, as well as throughout the whole winter. Some even give cake to their home-bred stock from the time they are six weeks old till they are sold to the butcher, and also to their bought in stock as soon as they are brought home. When turnips are scarce, and when potatoes are plentiful and cheap, the latter are given freely to feeding cattle, while the supply of oat-straw has often to be supplemented by hay. The breeding stock are generally kept in lean condition, and receive no artificial food. There is little doubt that the feeding of cattle is now carried on more extensively in both counties than twenty-five years ago, and that the quantity of feeding stuffs, such as cake and grain, consumed by feeding stock has increased enormously since 1855. It should be pointed out that a large number of cattle is prepared for the butcher in these counties every year that is not credited to them in the Board of Trade returns. These returns being collected in spring, cannot include those animals bought in during the summer and autumn, and sold off before the end of April. The number of cattle actually fed in these counties is therefore much larger than the Board of Trade returns indicate. It is hardly possible to give a general estimate of the weights of fat cattle sold in Forfar and Kincardine. They vary greatly; two-year-olds range from  $5\frac{1}{2}$  to  $8\frac{1}{2}$  cwt., and three-year-olds from 6 to  $9\frac{1}{2}$  cwt.

There are few points of more importance in connection with the live stock department of farming than the economising of the turnip crop, and there are perhaps few matters in which among farmers generally there is more room for improvement. Latterly many farmers in these counties have been giving much of their attention to the subject, with results that cannot fail to be beneficial. There is no doubt whatever that, generally speaking, farmers would find it to their advantage to give fewer turnips and more feeding stuffs to the cattle they are preparing for the butcher. Mr Buttar, Corston, Coupar-Angus, has for several years been following the pulping system, by which he has been able to economise his turnip crop to a remarkable extent. Formerly, Mr Buttar kept scarcely any but feeding cattle, which he bought in towards the end of summer and during autumn, and fed off by spring, the greater number

being sold off in winter. When housed for the winter the cattle were by degrees introduced to the pulped food, and when they had fairly taken to it the following was given:—

*Mixture for Ten Feeding Cattle for One Day.*

	Weight.	Value. s. d.
Straw, . . . . .	110 lbs.	...
Turnips, . . . . .	280 "	1 3
Linseed Meal (or 2 lbs. Linseed Cake), . . . . .	10 "	1 3
Decorticated Cotton Cake, . . . . .	20 "	1 8
Treacle, diluted, . . . . .	10 "	0 10
Totals	430 lbs.	5 2

After two months, 20 lbs. of crushed grain, maize, oats, and barley are added, bringing the total weight to 450 lbs., and the total to 6s. 10d.—an average weight of 45 lbs., and an average cost of barely 8½d. per day. The mixture is given in two meals a day, morning and evening. Mr Buttar also tried the keeping of store cattle, and finding pulping better adapted to this class of stock than to feeding cattle he now feeds only a few. He buys in lean cattle when about eighteen months old, in the autumn, selling off the majority in spring in good condition but not fat, and retaining a number of the best for feeding on grass in summer. For the first two months they are in the house the lean cattle get the following:—

*Mixture for Ten Store Cattle for One Day.*

	Weight.	Value. s. d.
Straw, . . . . .	110 lbs.	...
Turnips, . . . . .	112 "	0 6
Linseed Meal (or 1 lb. Linseed Cake), . . . . .	5 "	0 7½
Decorticated Cotton Cake, . . . . .	20 "	1 8
Treacle, . . . . .	7½ "	0 7½
Totals	254½ lbs.	3 5

After the first two months the mixture is increased by about one-third, or to the value of say 5s. 2d., making the average maximum cost about 6½d. per day. The mixture is given in three meals when it has been raised to the maximum quantity. The following shows the relative cost of the pulping, and the ordinary systems of feeding store cattle:—



*One Store Steer, Two Years Old.*

	Food.	Cost.
Ordinary System,	150 lbs. Turnips,	9d.
Pulping System,	34 lbs. of Mixture,	6½d.

The pulped mixture is made up each forenoon, and allowed to lie till next day before being used. A layer of straw is laid down first, then turnips, then cake, and lastly the diluted treacle. The heap is at once turned over three times, and then left untouched for close on, but never more than, twenty-four hours. In two hours two men and a boy make up a mixture for a day's feed to over 120 head of cattle. The pulping and bruising apparatuses are driven from the turbine wheel of the threshing-mill, so that there is no extra cost for motive power. The cattle relish the mixture very much and thrive admirably upon it. The straw in the mixture, and the supply always within reach of the cattle, is balanced by the manure.

*Polled Cattle.*—Probably no more interesting chapter in a history of the agriculture of these counties could be written than on the breeding of polled Aberdeen and Angus cattle. It is a subject of much importance, and has a history of peculiar interest. The materials, too, are plentiful. In a report such as this, however, unless it were to be enlarged to the dimensions of a volume, it would be impossible to enter anything like fully into the matter. A very brief account must suffice. In a word, it may be stated that the black polled cattle, now known as the polled Aberdeen and Angus breed, are the direct descendants of the ancient Angus "Doddies," and Buchan "Humlies," the native polled cattle of the north-east of Scotland. There have been much discussion and dissension as to whether Forfarshire or Aberdeenshire has the better claim to be considered the cradle of the improved breed; but into that question we do not intend to enter, nor need we dilate upon the value and importance of this fine breed, which is every year making greater and greater strides in popularity, and which may safely be said to have before it a brilliant and useful future. It is pretty certain that even before the advent of the present century, the excellent beef producing qualities of the polled breed had been discovered, and to some degree developed by method and care in breeding and rearing. It is well authenticated that, about the beginning of the century, it had attained to considerable popularity all over the north-east of Scotland, and that soon after several polled herds were founded in the ancient little county of Angus and elsewhere. Twenty-five years ago—at the commencement of the period to which this report specially refers—there were in For-

farshire a large number of polled herds, valuable, and in several cases very distinguished herds. Chief among these were the herds of the late Mr Hugh Watson, Keillor; the late Mr R. Scott, Balwylo; Mr Bowie, Mains of Kelly; the late Mr Fullerton, Mains of Ardestie; Lord Southesk; Mr W. Whyte, Spott; Mr J. Lyell, Shielhill; Mr W. Ruxton, Farnell; the late Mr James Mustard, Leuchland; and Mr Goodlet, Beauchamp; while just across the border into Perthshire were the herds of Mr T. Ferguson, Kinnochtry, and Mr James Leslie, Thorn. By that time a few herds that in their day had done much good, had ceased to exist. Among these must be specially noted the herd of the late Lord Panmure, whose name, through the famous bull Panmure (51), will for ever be associated with the glossy blacks. Rinderpest almost annihilated the Forfarshire polled stocks, and the majority of those herds named have become things of the past. The only ones now remaining are those at Mains of Kelly, Spott, Kinnochtry, and Thorn; but within the last fifteen years, the ranks of breeders have been recruited by the Earl of Airlie, the Earl of Strathmore, Mr Thomas Smith, Powrie; Mr William Smith, Stone o' Morphie; and Mr Ferguson Balunie. Lord Southesk, after a long interval, has also just procured materials with which to found a fresh herd. It may safely be said that the rinderpest scare, great as it was, has completely died out. Forfarshire is fast returning to its old love, and numerous as were its polled herds in Hugh Watson's time, there is every prospect of their being still more numerous at no distant day.

No one will deny that the credit of being the first to commence the systematic improvement of the polled breed belongs to the late Mr Hugh Watson. The intimate friend and occasional host of Sir Walter Scott,—the associate of the late Mr John Booth, Mr Wetherell, and other noted agriculturists, most of whom are now no more,—one of the most extensive, enterprising, and skilful farmers that have ever held land in Forfarshire, Mr Watson was a strikingly intelligent and accomplished man. He lived in advance of his time; and, like many other pioneers who would seem to have made their earthly pilgrimage prematurely, did not a little to facilitate the onward march of his fellow-men. In 1808 he commenced a herd of polled cattle. The foundation consisted partly of six cows and a bull left to him on the farm of Keillor by his father, and partly of ten of the best polled heifers and the best polled bull he could find in the great fair at Trinity Muir, Brechin. Unfortunately, there is no very complete record of Hugh Watson's practice in the breeding and rearing of his favourite blacks. The most we know of his method of breeding is, that he "put the best to the best, regardless of

affinity or blood." He evidently pursued in-and-in breeding to a considerable extent, and also aimed at rearing up separate and distinct families. He devoted a good deal of attention to the preparing of animals for shows, and in the hottest contests of the day he generally carried off the lion's share of the honours. After a brilliant and useful career of over fifty years his fine herd was dispersed in 1860. Shortly before, pleuro-pneumonia had dealt it a heavy blow, and in consequence it did not show to advantage. Moreover, the times were then unpropitious for polled cattle, and the prices obtained were comparatively low. The two highest priced cows went to the late Mr W. M'Combie of Tillyfour and Mr Thomas Ferguson, Kinnochtry, at £64 and £58, 10s. respectively. That Keillor blood has exercised a powerful influence in establishing the improved polled breed there can be no doubt; but as to the real extent of that influence we cannot stop to inquire.

Of the other early breeders few had a better grasp of the important subject in hand, or really did more to develop and perpetuate the good qualities of the polled breed, than the late Mr William Fullerton, Mains of Ardestie (formerly Ardovie). Had he done nothing else than establish the foundation of the celebrated Queen tribe, his name would have been indelibly associated with the breed as one of the most prominent of its earlier improvers. From his cow "Queen of Ardovie" (29), by "Captain" (97), and calved in 1836, he founded a famous and valuable strain; and from her in direct descent we have the Prides of Aberdeen, the Vines, the Duchesses, the Charmers, the Victorias, and the Dandies, the first of which, in the hands of the late Mr M'Combie of Tillyfour and others, attained a fame and value unrivalled by any family, excepting perhaps the Ericas of Ballindalloch. Then as to the Balwylo herd, which was long one of the largest and best known in the country, we have in several existing herds unmistakable testimony of its exceptionally high character. Mr Scott's well-known bulls, "President" (205), "President 2d" (54), and "President 3d" (246), all appear in the pedigree of the 270 guinea cow "Pride of Aberdeen 9th," in the possession of Mr Auld, Bridgend; while the Balwylo Queens have long been well known. On the death of Mr Scott, his mother, who still survives, carried on the herd successfully, but unfortunately the plague made sad havoc here also. Both Mr Fullerton and Mr Scott won many show-yard honours, both in local and national shows. The former lost no fewer than eighty fine animals from pleuro-pneumonia. The Shielhill herd produced many excellent animals, notably the bulls "Prospero" and "Tom Pipes," which were victorious both at the Highland Show at Perth in 1861, and at the Royal Show

at Battersea in the following year. Mr M'Combie stated that he believed no purer stock existed in Forfarshire than the Leuchland herd, and that he "often admired its purity, style, and condition," the late Mr J. Mustard having been a moderate but judicious feeder. This herd also fell a victim to rinderpest. The earlier Kinnaird herd had a long and useful career. From a very early period in the century there had been a pure herd of Angus cattle at Kinnaird; but it was not until the present Lord Southesk succeeded that the stock was brought out to full advantage. Mr M'Combie says that, before being annihilated by the plague in 1866, the Kinnaird herd was "almost the best in the land," and adds that "Lord Southesk spared no expense in purchasing the finest animals, and had an able assistant in his brother, the Hon. Charles Carnegie," a gentleman who is not only an enthusiastic admirer of the breed, but has also an intimate knowledge of its history and pedigree. The best testimony to the character of Lord Southesk's herd is to be found at Ballindalloch in the celebrated Erica family, one of which, "Echo," has just been brought back to the home of her ancestors by Lord Southesk at the handsome sum of 200 guineas. The descendants of "Fanny of Kinnaird" (330), are also in high repute. Of several other defunct Forfarshire polled herds, good testimony is still to be found in different stocks throughout the country. The Thorn herd came prominently to the front many years ago. In 1864, Mr Leslie's bull "President 4th" (368), out of Mr Ruxton's "Flower of Strathmore" (479), and got by Mr Scott's "President 3d" already referred to, was first as a yearling at the Highland Show at Stirling, and first at the same show at Inverness the following year. This fine bull was sold by Mr Leslie at a long price, and was used at Tillyfour.

The Mains of Kelly herd is the oldest now existing. Founded in 1810 or 1811 by the late Mr Bowie, this celebrated herd has had a long and brilliant career, made almost romantic by its deadly struggles and narrow escapes in the days of rinderpest and pleuro-pneumonia. The actual foundation on the female side was a cow picked up on Mr H. A. F. Carnegie's property of Spynie and Boysack. From this cow, named "Boysack," "Jenny" (55), "Rose of Kelly" (828), and other famous animals were descended. It is from its achievements in the male line that Mr Bowie's herd stands out the most prominently. Indeed, it is not too much to say, that in this respect it has had few if any equals. "Cupbearer" (59), spoken of as one of the finest polled bulls ever seen, and his equally famous half-brother "Hanton" (228) are as household words among breeders of polled cattle. The former, out of "Rose of Kelly" (828), and

got by "Pat" (29), was a noted showyard winner. In 1852 he was purchased by Lord Southesk at £60, and at Kinnaird he produced many meritorious animals, including the celebrated showyard bull "Druid" 225. "Hanton," also got by "Pat" and out of "Lizzie" (227), was purchased in 1854 by the late Mr M'Combie of Tillyfour for £105, and he too was the sire of many excellent animals. Indeed, Mr M'Combie says that "Hanton" with Mr Watson's "Angus" (45), and with "Panmure" (51) was, in the male line, his "herd's fortunes." "Hanton" won several showyard honours, including the first prize at Paris in 1856, where he was placed before "Cupbearer," who was the older by two years. By rinderpest and pleuro-pneumonia, Mr Bowie's herd was reduced from ninety-three to twenty-one, but since then it has almost regained its wonted strength, and numbers over fifty head. The Victorias, a branch of the Queens of Ardovie, are the most famous tribe now in the herd, the other leading strains being the Jennets, the Marthas, and the Lizzies.

In seniority, Mr Whyte's herd at Spott comes next. Mr Whyte has been breeding polled cattle for about thirty years, and many of his animals have in reality a longer line of distinguished ancestry than their recorded pedigrees indicate. A careful judge and enthusiastic admirer of polled cattle, he has done a great deal in an unostentatious way to improve the properties of the breed and to add to its popularity. Most of his stock trace back on the male side to "Othello" (319), bred by Mr Lyell, Shiellhill, and got by "Tom Pipes," the winner of the first prize at the Highland Show at Perth in 1861.

Lord Airlie commenced the breeding of polled cattle about twenty years ago, but it was not till about 1865 that he began to devote his attention to the subject in thorough earnest. Deeply interested in all matters affecting agriculture, his lordship devotes special attention to the breeding of polled cattle, and in a comparatively short time he has succeeded in bringing his herd to the front. Among his first purchases were "Victoria of Kelly" (345) from Mr Bowie, "New Year's Day" (1124), and "Jessica 2d," and several heifers from Mr Whyte, Spott; while in 1870 and the following year his herd was largely augmented by important purchases at Mulben, Aldbar, The Burn, Spott, Thorn, and Mains of Kelly. Subsequently he made selections from the Easter Tulloch and Johnston Lodge, the Gavenwood, Ballindalloch, and Tillyfour herds. At the late Mr M'Combie's sale at Alford, in 1874, he secured at high figures four of the best bred cows and heifers sold, some of them being of the famous Pride tribe, while at the dispersion of the Tillyfour sale last

August he made the following very important purchases:—  
“Pride of Aberdeen 5th” (1174), at 135 guineas; “Pride of Aberdeen 23d” (calf), at 35 guineas; and “Sybil 1st,” at 110 guineas. The first was the only daughter of the original “Pride” in the catalogue, and though in her thirteenth year, looked fresh and useful. She has bred several very fine animals, including the “Shah,” for which Mr Ferguson, Kinnochtry, obtained the first prize at the Highland Show at Dumfries in 1878, “Lilias” of Tillyfour, and “Pride of Mulben,” for which Sir George Macpherson Grant, Bart. of Ballindalloch, paid 91 guineas at the dispersion of the Mulben herd. The “Pride” calf is out of “Royalty” (3053), a very heavy, handsome Pride cow, which was bred by Lord Airlie, from whom she was purchased by the late Mr M’Combie, and which at the Tillyfour sale was taken out by Mr Duff of Hatton at 80 guineas. Her other daughter, “Pride of Aberdeen 15th,” went to Sir Dudley Coultts Marjoribanks, Bart. of Guisachan, at 105 guineas. “Sybil 1st” was bred at Baads, got by the prize bull “Sir William” (705), and among other honours won the first prize as a cow at the Highland Show at Edinburgh in 1877, and the first prize and the challenge cup for the best animal of the breed at the Aberdeen Show the same year. She is now in her eighth year, but looks remarkably fresh and lively. Her daughter, “Sybil 2d,” won in the cow class last summer (1880) at the Royal Show at Carlisle, and the Highland Show at Kelso, and also at the Aberdeen Show, where she likewise won the “M’Combie Prize” for the best polled animal shown, her chief opponent being the Marquis of Huntly’s famous bull, “Monarch.” Animals of so rare merit as these three can hardly fail to leave their mark upon the herd. Many coveted showyard honours have lately fallen to the Cortachy herd. At the last Highland Show the first prize, both in the yearling and two-year-old heifer classes, went to Lord Airlie, the winner in the latter class “Pavillion”\* (3772), bred by Mr Hannay of Gavenwood, out of “Patience of Corskie” (1932), and got by “Clansman” (398), having also headed the heifer class at the Royal Show at Carlisle, and for the second time won the cup for the best polled animal exhibited at the Angus and Mearns Show. In addition to these, the Ericas and other noted tribes are represented in the herd. On the male side, Lord Airlie has drawn largely upon Ballindalloch blood. At a draft sale in the autumn of 1876, seven cows averaged over 41 guineas each; six two-year-old heifers, 32½ guineas; and four yearling heifers, 43½ guineas; while the famous “Jury-

\* We regret to have to state that since the above was written, this fine heifer (“Pavillion”) has died.

man of Ballindalloch," who was used in the herd with great success, was bought by Mr Grant, Advie, at 57 guineas. Another draft sale was held at Glamis last September, when forty-three animals brought an average of £30, 3s. each.

Though comparatively young, Lord Strathmore's polled herd is one of the choicest and most valuable in the country. Founded in 1876, it has been rapidly brought into a prominent position. None but animals of really high merit, both in breeding and character, were bought; and as his lordship did not hesitate to pay pretty long figures, the very best material was obtained at the outset. The first purchases were made at the Mulben, Ballindalloch, and Drumin sales in 1876; subsequent selections being made at Advie, Gavenwood, Tillyfour, and elsewhere. The herd now numbers eleven females and three bulls; the females being—"Beauty of Glamis" (3515), "Beauty 1st of Glamis" (3314), "Blanche of Advie" (3588), "Cowslip of Glamis" (3313), "Echo," late "Evelyn" (4119), "Ellen 2nd of Mulben" (2358), "Ellen 1st of Glamis" (3311), "Julia," by "Elcho" (595), "Mina 5th" (3844), "Sweetheart" (1689), and "Violet of Montbletton." The valuable sire, "Elcho" (595), bred at Ballindalloch and belonging to the Erica tribe, presides over the herd, and is to be assisted by "Bismarck 2nd" and "Knight of the Legion," two very fine young bulls purchased at the dispersion of the Tillyfour herd at 72 and 40 guineas respectively. In September last a draft of the herd was sold jointly with a draft from the Cortachy herd. Lord Strathmore's lot of twenty-two animals brought an average of close on £36 each.

Mr Thomas Smith's herd at Powrie is one of the largest, and also one of the best, in the country. It numbers close on sixty head, and combines excellent blood with high individual merit. The handsome cow, "Ruth," purchased at the Tillyfour sale in 1878, has done well here, having produced a pair of beautiful heifers. From Easter Tulloch at various times some very good animals have been obtained, including "Mayflower 2nd," the mother of that charming little cow, "Witch of Endor" (3528), for which Sir Dudley Coutts Marjoribanks paid 155 guineas at the Tillyfour dispersion sale; "May 2nd" (3727), "May 3rd" (3728), "Levity" and "Old Jean," the latter a wonderfully fresh cow of twelve years. The "Mayflower" cow had a very fine heifer calf last season, while "May 2nd" herself, a very tidy compact cow of rare symmetry, has an excellent yearling heifer in the herd. One of the sweetest cows in the herd is "Naomi" (3730), bred by Mr McCombie of Easter Skene, out of "Prudence" (1809) by "Clansman" (398), and got by "Bachelor of Ballindalloch" (690). For a few years Mr Smith's stock bulk

has been "Norman" (1257), bred at Cortachy and got by "Juryman" (404), while at the Tillyfour dispersion sale he was fortunate enough to secure at a small figure Lord Huntly's well-known Highland Society winner, "Monarch" (1182). Mr William Smith's herd at Stone o' Morphie is not large, but also contains both good blood and high individual merit. Mr W. Smith has bred many very good animals. "Griselda" (3877), the highest priced animal at the joint sale held last September by the Earls of Airlie and Strathmore, was bred at Stone o' Morphie. Her sire was "Timour 3rd" (1287), a bull that has produced some excellent stock to Mr Smith. He was bred by Mr F. G. Forsyth Grant of Ecclesgreig.

The Balunie herd is small but very choice. It was founded in 1876 by the purchase of "Dido," a heifer, at the Cortachy sale, the price being 38 or 39 guineas. She was then rather small, but has turned out well. Her dam went to Kinnochtry at the same time at 69 guineas, and was bought two years before at Tillyfour at 76 guineas. At Balunie, "Dido" has produced three heifer calves, all got by the "Shah," and all animals of exceptional merit. Indeed, last summer Mr Ferguson refused 100 guineas for her and the heifer calf at her foot. His second purchase was one of the "Heather Blossom" twin heifer calves, sold at the Corskie sale in 1877, the price being 33 guineas. This calf's dam went, at the same time, to Mr Pearson of Johnston Lodge at 111 guineas, and its own brother, "Warrior," to the Marquis of Huntly at 155 guineas. She, too, has done well at Balunie, having, along with "Dido's" heifers, won several local showyard honours. Her first calf, unfortunately, died; but last season she produced a very pretty heifer. The remainder of this small but promising herd consists of three females bred at Kinnochtry.

Mr Thomas Ferguson's herd at Kinnochtry, though in Perthshire, is so close to the Forfarshire boundary that we may take a passing glance at it. This valuable herd numbers no fewer than seventy-eight head, and contains many very fine animals. It was founded in 1835. Four years after, "Young Favourite" (61), a daughter of "Old Grannie (1), was purchased, while a few more years brought in the old grey-tailed cow of Keillor, now known as "Favourite 2nd." From the former animal the Baronesses and Princesses are descended, and from the latter the Favourites. These tribes still form by far the majority of Mr Ferguson's herd, which is thus, more than any other herd, composed of Keillor stock. Mr Ferguson has won many victories in the showyard. At the Highland Show at Dumfries in 1878 his stock bull the "Shah," bred at Tillyfour, was first in the old bull class, and a Baroness heifer first in



the two-year-old heifer class; while, at the same show at Kelso in 1880, a Baroness bull, of his own breeding and got by the "Shah," headed the two-year-old class. He has also frequently obtained very high prices for animals bred at Kinnochtry. At the Highland Show at Perth in 1879 he sold some young heifers and a young bull for exportation to the United States of America.

At Gwynd the representatives of the late Mr Pearson have still some very good polled cattle.

Kincardineshire has also played a not unimportant part in the developing and establishing of the improved polled breed. The late Mr R. Walker, Portlethen, was, for over fifty years, one of the leading breeders of polled cattle in the country. He obtained his first bull, "Colonel," in 1818, and had at that time a stock of good nonpedigreed black polled cows, most of them having a brown stripe along the back and also partially light-brown ears. By 1826 his pedigreed herd was fully established, and he carried it on with great success as long as he lived. It usually numbered from 80 to 100, but sometimes comprised as many as 110 or 115. The greater portion was dispersed in 1874, but a part was retained and is still successfully carried on by his son, Mr R. B. Walker, who succeeded him in the Mains of Portlethen. The late Mr Walker's success in the showyard was quite exceptional. Mr M'Combie says—"It would be endless to attempt to sum up his victories—local, national, and international—they are spread over such a large surface." Mr Walker bred a large number of celebrated animals, both male and female. Among his more noted bulls was "Fox Maule" (305), got by "Marquis of Keillor" (212), and out of "Matilda Fox" (302), bred at Mains of Kelly, and got by the famous "Cupbearer" (59). "Fox Maule" won many showyard honours, and is described by Mr M'Combie as "one of the best polled bulls ever exhibited." The "Banks of Dee" is also said to have carried everything before him in showyards, while, in one season, "his descendants gained seven first and one second prize." One of the best animals in the herd at the time of its dispersion was "Madge" (1217), which was secured by Mr William Macdonald for the Marquis of Huntly. This fine cow has herself achieved many victories, while her stock have been perhaps still more successful. Her son, "Monarch," now at Powrie, won first prize both at the Aberdeen and Highland Shows in 1880; while, at the former, the special prize for the best family of the breed, consisting of a cow and two or more of her own produce, was awarded to "Madge" and her stock, against a very fine group of "Ericas" from Ballindalloch. "Madge" was bred at Tillyfour.

The late Mr Hector, Fernyflat, was long an extensive and successful breeder of polled cattle. He secured the best of blood, and produced stock of a very high character. He won many prizes at both local and national shows. Mr Hector was recognised as one of the best judges of black polled cattle of his day. After his death the herd was carried on by his son-in-law, Mr Arthur Glennie, who succeeded to Fernyflat. The latter died in 1875, and in the following year the herd was dispersed. Among others who for some time bred polled cattle in this county, we may mention the late Sir Alexander Burnett, Bart. of Leys; and his son, Sir Thomas Burnett, Bart.; and Mr P. Davidson of Inchmarlo. Colonel M'Inroy, The Burn, has for a long time had some good polled cattle; while, latterly, Lord Clinton has been breeding a few.

Mr F. G. Forsyth Grant of Ecclesgreig, St Cyrus, has a small but very good herd, containing some excellent Forfarshire blood from Balwylo, Mains of Kelly, and elsewhere. He was the breeder of "Timour 3rd" (1287), a bull that, in the neighbouring herd of Mr W. Smith, Stone o' Morphie, already noticed, got some very fine heifers. At Johnston Lodge, Mr Pearson has a valuable herd, numbering fifty head. Most of the cows belong to Ballindalloch, Rothiemay, and Balwylo strains; while the bulls used were bred at the Thorn, Portlethen, Tillyfour, and Gavenwood, the one bred by Mr Hannay being now in use. One of the most important purchases was the fine cow, "Heather Blossom," at the Corskie sale in 1877 at 111 guineas. The herd was founded in 1869, and has been successfully and carefully conducted.

Sir Thomas Gladstone, Bart., of Fasque, has a herd that displays good breeding and excellent character. It numbers about thirty head. At the Balwylo sale in 1863, the cow, "Eugenie" (458) and the bull "Randolph" (389), were purchased, and from these the main portion of the herd is descended. The cow's granddaughter, "Eugenie" (3910), a thick massive fresh looking ten-year-old cow still in the herd, has produced no fewer than eleven calves, the majority being females, also still in the herd. Herself a good looking cow, her stock as a lot would be very difficult to beat, being strong, thick, well formed, and richly covered with flesh, and good milkers. Some of them have carried everything before them in the local shows. There is also some Easter Skene blood, through "Nigris," in the herd. Sir Thomas has been lucky with his bulls. At a sale at Portlethen in 1869, Mr Murray, his local factor, secured at a small figure the bull calf "Adrian," and so well did that animal turn out, that at Kelso in 1872 he headed a strong class of aged bulls, and was considered one of the most complete bulls seen for years. At

the Aboyne sale last year (1879), Mr Murray purchased, also at a small price, the bull calf "Diamond," by "Waterside King" (870), and out of "Daylight" (1478), by "Clansman" (398). This bull has also done remarkably well, being a large, handsome, stylish bull. He won the cup for the best pure bred animal in the Kincardineshire Show last summer, and will in all probability gain still higher honours.

By far the largest polled herd that exists now, or has ever existed, is that owned by Mr James Scott, of Easter Tulloch. For a long time Mr Scott has been breeding black cattle, and partly through the prolific character of his stock, and through purchases, his herd had a few years ago assumed great dimensions. It numbered at one time not far short of 200 head. Within the last two years over fifty head have been sold, chiefly at Aberdeen, but still the herd is by far the largest of its kind existing. And not only is it large, but it also contains many animals of more than average individual merit, and of really good breeding. His herd is invariably kept in lean condition, and it is seldom that he feeds for the showyard. His stock has, however, carried off many prizes, while in the possession of others. The highly satisfactory manner in which Easter Tulloch stock thrive and breed with those that purchase them is quite proverbial, and this is no doubt mainly due to the moderate, indeed almost spare, system of feeding pursued by Mr Scott, and also to the fact that his cattle spend much of their time in the open fields. There is a good deal of variety in the herd, containing as it does representatives of the Kinnochtry, Southesk, Balwyllo, Keillor, Ballindalloch, Tillyfour, Portlethen, Fernyfiat, and several other herds. One of his own oldest tribes is the Blue Bells, descended on the female side from "Bess," a cow bred by Mr Robert Scott, Upper Tulloch, and on the male side from "King Henry" (390), bred by Lord Southesk, out of "Kathleen of Kinnaird" (339), a well-known prize winner and got by "Windsor" (221), the famous "Tillyfour," son of "Hanton," for which Lord Southesk paid £180 in 1858 to the late Mr George Brown, Westerton. Some very fine bulls were bred from the Blue Bells, notably "Bluebeard" (648), the winner of the first prize in the two-year-old class at the Aberdeen Show, and also at the Highland Show at Inverness in 1874. He was one of the best two-year-olds ever seen in the Aberdeen Show, and it is to be regretted that his career was curtailed by foot and mouth disease, to which he fell a victim in his third year. But of all the really good animals bred by Mr Scott, and descended from his stock, perhaps the most celebrated is the beautiful three-year-old cow "Witch of Endor" (3528), already referred to. She was one of the fine group with

which the late Mr M'Combie "swept the field" at the Paris Exhibition in 1878. Got by the Easter Skene bull "Valiant" (663), she is out of "Mayflower 2nd, of Easter Tulloch" (3521), now at Powrie, and got by "Emperor of Easter Tulloch" (396), which was bred at Ballindalloch.

*Shorthorns.*—Shorthorn breeding has almost ceased to exist in Forfarshire. It was never pursued to any great extent, but some time ago there were a few fair-sized and well-bred herds in the county. The largest, and perhaps also on the whole the best, was that carried on for about thirty years, first at Kincaig near Brechin, and latterly at Old Montrose, by Mr Charles Lyall. Among his first purchases were four animals from the late Captain Barclay of Urie, while from other herds well-bred females were subsequently obtained. The stock consisted of mixed Booth and Bates blood, and Mr Lyall having frequently gone to the noted English herds for his bulls, the best strains were engrafted upon his herd. Among the sires used were Lord Dunmore's "Crown Prince" (28,281), and Colonel Kingscote's "Duke of Dursley" (25,953), the latter having been the last bull used in the herd. The herd had become a large and very flourishing one about 1860, but in 1865 rinderpest killed no less than fifty-six, leaving only a very few that were enclosed in a garden surrounded by a high wall. With these few and others purchased, a fresh start was made, and in a short time a large and very good herd was again established. In October 1874, however, it was dispersed. The average obtained for thirty-eight head was about £30. Mr Lyall has still a few shorthorn cows, but has not again entered into shorthorn breeding with thorough earnest. With animals of his old herd he won many prizes. Previous to the outbreak of the rinderpest, Lord Airlie had a good shorthorn herd for some time at Cortachy; while others who bred a few shorthorns for a time have also given them up. The chief shorthorn breeders now are Mr Arklay of Ethiebeaton, Monifieth; Mr Granger, Pitcur, Kettins; Mr Hume, Barrelwell, Brechin; and Mr Arnot, Mains of Glamis. The herds of these gentlemen, however, are small. Mr Arklay's stock bull "Master Toddles" (40,331), was highly commended in a very strong class at the Highland Show at Kelso in 1880. Though shorthorn breeding is now carried on only to a very limited extent in Kincardineshire, yet this county figures prominently in the early history of the shorthorn in Scotland. Probably no name is so closely associated with the introduction of the fashionable "red, white, and roan" into the north of Scotland as that of the late Captain Barclay, from whose celebrated herd at Urie the ancestors of a great many of the shorthorns now in the northern counties were obtained.

Captain Barclay's herd was founded in 1829 by the purchase of "Lady Sarah," the best cow at Mason's famous sale at Chilton. Subsequently, selections of well-bred cattle were made, and a very choice herd established. In 1836 or 1837 these were sold off; but soon after, Wetherell, the great auctioneer, was commissioned to select in England and send to Urie a foundation for a fresh herd. Ten heifers were sent, and it is stated that they were not of very high merit. A stock bull, however, "Mahomed" (6170), a son of the old cow "Lady Sarah," was brought back, and his influence produced a wonderful effect. From these ten heifers a great number of the shorthorns now in the North of Scotland are descended, and there is no doubt that their good qualities are largely due to the "Mahomed" cross.

### *Horses.*

The following figures show the number of horses in the two counties at various times since 1854:—

	Forfar.	Kincardine.
1854, . . . . .	9306	3984
1870, . . . . .	9323	4305
1875, . . . . .	9988	4695
1880, . . . . .	10,443	4903
Increase in Forfar since 1854, . . . .		1137
„ Kincardine „ . . . .		919

There is an apparent slight decrease in the number of horses in Forfarshire this year as compared to twenty-five years ago, but in reality this is not so. The Board of Trade returns prior to 1869 included horses belonging to all classes of the community, and now they include none but those owned by occupiers of land. About twenty-five years ago, the number owned by occupiers of land did not exceed 9500, or nearly 1000 fewer than were returned last spring. In Kincardineshire, as will be seen, there has been a pretty large increase. Of the horses returned in Forfar this year, 8451 are used solely for agricultural purposes, the other 1992 being unbroken horses and mares kept for breeding purposes. The corresponding figures for Kincardine are 3863 and 1040. On most farms, as many horses are bred as maintain the force required; but breeding for sale is carried on only to a very limited extent. The exorbitant prices reached for horses a few years ago gave a great spurt to breeding for a time; but, with the recent fall in prices, matters have in this respect resumed their normal condition. It is seldom that horse breeding is found to be profitable on farms where the ordinary mixed system of husbandry is pursued.

There is perhaps no part of the country where men and horses accomplish more work than in these counties. Both are well fed and well housed, and are perhaps quite as well worked. On the heavier soils, from 50 to 60 acres of land are allotted to each pair of horses, the extent in the lighter districts ranging from 70 to 80. Since 1855 there has undoubtedly been great improvement in farm horses, mainly through the introduction of superior Clydesdale stallions, in which respect the agricultural associations and many of the landed proprietors have done good service to the country. The farm horses, as a rule, partake much more than they did twenty years ago of the Clydesdale stamp. They are, generally speaking, of a very good class, strong, active, and hardy.

Throughout both counties there are a good many well-bred Clydesdales. The best stud unquestionably is that which Lord Strathmore has carried on at Glamis, with so much success and such great benefit to the country for well nigh twenty years. This stud was founded in 1869 by the purchase of "Maggie" (404) then two years old, and shortly afterwards of other two mares from the celebrated stud of Mr Anderson, Gillespie. The first stallion used was "Lofty 4th" (461), and from him and these mares several excellent foals were raised, all of which were sold with the exception of "Miss of Glamis" (406), the dam of "General Lee." In 1871 the "Prince of Renfrew" (664) was used, being followed the next two seasons by the famous horse "Clansman" (150), whose sudden death put an untimely end to a very useful career. The present stud horse, the "Thane of Glamis" (855), got by "Clansman," was next obtained, and from him, as from the others, some very good stock has been produced. The stud at present numbers eight mares, all well-bred, of good form and in the best breeding condition. They are as follows:—"Maggie of Glamis" (404); "Miss of Glamis" (406); "Susie of Glamis" (408); "Flora of Glamis" (410); "Duchess" by "Thane of Glamis" (855); "Darling," also by the "Thane"; "Countess," by "Farmer" (286); and "Victoria" by "Victor" (895); and out of "Maggie" (404). Mr Watson, Ochterlonie, not far from Glamis, has a few very good Clydesdale horses, and has been winning prizes at the Glasgow Show with fillies of his own breeding. Mr Whyte, Spott, who is a good judge of horses as well as of cattle, has also bred some very good horses; while Mr Bruce, Jordanston, Meigle, and others throughout Forfar, have two or three good Clydesdale mares. In Kincardine there are a good many well-bred Clydesdale horses, at Johnston Lodge, Pittengardener, Fasque, Portlethen, and elsewhere; but there are no studs kept for the special purpose of breeding. Mr Baird established a very fine stud at Urie a few years ago, paying very high prices for his animals; but they were all dis-

persed recently. The late Mr Walker, Portlethen, who was an excellent judge of all kinds of stock, always kept a very fine lot of horses on his farms, the majority of them being either jet black or grey in colour.

### *Sheep Farming.*

Sheep farming is carried on extensively in both counties. The hills are, on the whole, fairly well adapted for it. The winter is somewhat severe on the higher reaches, and there is rather too much black ground for the extent of green land. With very few exceptions the sheep-runs are safe and sound. The Grampian range in Forfarshire is intersected by several extensive and beautiful glens, drained by numerous waters and streamlets, alongside which, and on all the lower stretches, there is a good deal of excellent green pasture. Half way up the heights there is, as a rule, hardly any vegetation excepting heather; while a little higher in many cases we find little or nothing covering the rocky surface. The scenery displayed in some of these glens is very grand, and in the summer they are popular resorts for tourists and other pleasure seekers. The extreme west of the hilly division of the county is bound in by Glenisla, the parish of which extends to 41,375 acres. In this large glen there are some good arable farms, several very good grazings, and a large extent of excellent shooting ground. The smaller glen of Lintrathen lies on the south-east, while on the north-east of it, again, Glen Prosen and Glen Clova stretch away back past the top of Lintrathen, and join Glenisla on the watershed near the boundary of Perthshire. Of these glens, Glen Clova is rather the best. Its flora is remarkably rich, containing as it does many rare plants. The haughs by the watersides are cultivated and held mostly in small farms, on which a good many cattle are bred and sold as yearlings, or when eighteen months old, to farmers in the lower parts of the county. Most of these small tenants also keep a number of blackfaced sheep, and rear greyfaced lambs, which they sell to the larger sheep farmers. There is a large extent of green land in Clova, the hillsides in some parts being partially green up to a high elevation, while almost to the tops the heather is mixed with "month" or "moss" grasses. In Glen Prosen, the lower portion in particular, there is also a good deal of green land. Glen Moy and Glen Ogle are offshoots from Glen Clova, and they too contain some good land, and also carry some very fine flocks. The greater part of the north-western portion of the hilly range is occupied by Glenesk and Lethnot, the former being the largest glen in the county. Generally speaking, these glens also contain less green land than Clova, the greater portion being covered with heather, mixed

here and there with month or mosses. On the lower parts, however, there are many bogs and swamps, which, when surface drained, afford rich pasture. Passing into Kincardineshire, the hilly range retains its black heathy aspect on the heights all through Glendye, and as far north-east as the junction of the parishes of Durris, Fetteresso, and Glenbervie. As in Glenesk and Letlnot, there is a good deal of green land in the valleys in the Kincardine range; but here also the hill tops as well as the sides far down are covered almost solely by heather. It is, however, a peculiar but proverbial fact, that the heather in Glendye is of finer quality than in most other parts of the Grampian range. It is supposed to be sweeter, and not so rough and strong as in the greater portion of the higher hills in Forfarshire. The larger part of the hilly range of both counties is devoted to sheep farming; but in Forfarshire there are several extensive deer forests, the dimensions and number of which have been considerably increased since 1855.

The following table shows the number of sheep in both counties at various times since 1854:—

	Forfar.	Kincardine.
1854, . . . . .	105,028	35,195
1870, . . . . .	119,841	32,101
1875, . . . . .	121,973	36,174
1880, . . . . .	122,857	32,308
Increase in Forfar since 1854, . . . . .		17,829
Decrease in Kincardine do. . . . .		2,887

It would seem that the number of sheep in Forfarshire has been gradually increasing, and it is equally clear that latterly Kincardine has been going the other way. Between 1854 and 1870 there had been an increase in Kincardine, the number in 1869 having been 41,031. The increase in the arable area of the cattle stock is no doubt partly to blame for the decrease in the sheep stock since 1870. A good many farmers who for several years after the outbreak of rinderpest fed or wintered a large number of sheep, have now abandoned this system, and keep cattle for all. The sheep stock paid pretty well, but many farmers found that under sheep their land was beginning to produce too much straw, and that the grain was becoming lighter in weight than formerly. As in regard to cattle, the stock kept and general system of management in the two counties are very similar. The Blackfaced breed has the field almost entirely to itself. Occasionally a few Cheviots have been kept, but at present there are no regular flocks of this breed. The stock consists mainly of wethers of different ages, bought in as lambs at the great Lanark market. Breeding is carried on only to a very limited extent. Most of the small tenants along the foot of the hills



keep small flocks of blackfaced ewes, and from these and Leicester tups they raise a very good class of greyfaced hogs, which they generally sell to be fed on arable farms in the lower parts of the county. A few of these small tenants rear purebred blackfaced lambs, and of these the wethers are sold to larger farmers to make part of their stock, while the ewe lambs are retained by themselves to replenish their ewe stocks. On the lower and greener parts of the larger grazings, a few ewe stocks are also kept. The largest breeding stock belongs to Mr William Whyte, Spott, who, with his father and brother, also owns the largest general flock. Mr Whyte's flock of ewes numbers about 1000 head, and they are of a very high character. He is careful to use good tups and also feeds well, and thus rears a class of wethers that are invariably about the best reared in the northern half of Scotland. The system of management will perhaps be best understood from a brief sketch of the treatment a flock receives from the time it is bought in till it is sold off as two and a half or three and a half year olds. When taken home from Lanark the lambs are washed or dipped. For a short time they are kept on clean land preserved specially for them, care being taken not to give them too rich pasture at the outset. If commenced on moderate pasture they are usually hardier for the winter, than when they are fed highly at the outset. In the first or second week of October they are taken down from the hills, and kept on grass in the lower parts of the county till February, when they get a daily supply of turnips, the cost of this system of wintering ranging from 4d. to 10d. a head per week. They are returned to the hill about the second week in April, and are clipped about the 20th of June, being taken down again about the first or second week of October, and wintered on grass as the first winter, excepting that if they are not to be sold three and a half years old they receive no turnips. When they are to be sold off when two and a half years old, they are wintered almost as well as when hogs, receiving a liberal supply of turnips. In their second and third years they are dipped before being sent to the wintering. A much larger number is now sent off when two and a half years old than formerly, which is in the main the result of a more liberal system of feeding during winter, and of the early maturing properties of the breed being made the subject of more special care. When sold the large majority are in pretty high condition, many almost fit for slaughter, the general time for selling being about the middle of October. The large majority are sold at local markets, some being sold at home by auction and others sent to auction marts. From the higher reaches the whole stock have to be withdrawn during from six to twelve weeks according to the character of the weather; but on the

lower and better parts, a good many wethers and ewes are retained during almost the whole winter, being shifted only when a very severe snowstorm sets in. Generally speaking, sheep are much better wintered now than twenty-five years ago, and on the whole there has been a slight improvement in the character of the stock, though even as far back as 1855 a very high class of sheep was kept in these counties. The only changes in the system pursued since 1855, are that a greater number of sheep are bred, and that a much larger number of the wethers are now sold off at two and a half years old. Indeed, nearly one-half of the whole stock is now sold off at that age. Breeding stocks, of course, require rather more careful management than the wether flocks. The tups are let loose about the 22d of November. The ewes are taken to low ground for a short time when their regular runs are deficient in pasture, or when there is a heavy snowstorm on the hills; but they receive no turnips. In a good year a lamb for almost every ewe is reared in some flocks, ninety per cent. being about the average. Among lambs the annual death-rate is about five per cent., and among older sheep from two to three. In exceptionally bad seasons, of course, the loss by death is much greater than this, but on the other hand it is sometimes less. Of every one hundred wether lambs bought at Lanark, probably about ninety are sold when two and a half or three and a half years old. The death-rate among ewes is not, as a rule, much higher. Ewes are generally sold as "casts" when four or five years old, most generally five. Ewes are a week or two longer in being clipped than wethers. The average yield of wool from ewes would be from 3 to  $3\frac{1}{2}$  to 4 lbs.; from hogs,  $3\frac{1}{2}$  to  $4\frac{1}{2}$  lbs.; and from wethers, 4 to  $5\frac{1}{2}$  lbs., sometimes even as much as 6 lbs. The whole stock on some of the better farms, when well wintered, averages close on 5 lbs. a head of unwashed wool. The large majority, however, are rather below that. The dipping mixture used, to which a little castor oil is occasionally added, costs from a 1d. to 2d. a head. None are smeared now. The wintering of hogs or lambs from the middle of October till the second week in April, costs from 7s. to 10s. a head, the average being about 8s. or 8s. 6d. For a shorter period, and without turnips, older sheep cost from 3s. to 5s. a head. The rent of sheep farms has risen fully as much as that of arable land since 1855. It has increased by about 25 per cent. since 1860. For grazings on which sheep cannot be kept during winter, the rent averages from 3s. to 4s. per head of the stock the farms maintain; while for breeding and wintering land it ranges from 6s. to as much as 10s. a head. For one large farm in the north-eastern division of the county of Forfar, now rented at £400, the rent paid thirty years ago consisted of one hundred three-year-

old wethers. Shepherds' wages have almost doubled during the past twenty-five years. In the winter season each shepherd has from 400 to 500 sheep under his charge, the "hirsels" in summer ranging from 500 to 1000 each. The duties of the shepherds have been lightened greatly since 1855 by the erection of a large stretch of ring fencing, erected mostly by the proprietors, the tenants paying interest on the outlay. Many of the grazings have also been greatly improved within the past twenty-five years by surface draining, effected partly by the proprietors, but mostly by the tenants. Very few sheep are lost by drowning, and both counties are on the whole remarkably healthy for stock. It is seldom that disease of any kind breaks out among the flocks, but occasionally braxy causes loss when great care is not taken to shift the hogs and wethers in good time for wintering. At Lanark the wether lambs cost from 11s. to 15s. a head, and when sold at three and a half years old bring £2 or more, while they weigh on an average about 58 lbs. Some of the better stocks, such as those of the Messrs Whyte, Mrs Kennedy, Glenmoy, and others, often reach 64 lbs. a head. In Glendye, Sir Thomas Gladstone, Bart. of Fasque, has the largest single sheep stock in either county. It numbers about 4000 head, from 700 to 800 being ewes and the remainder hogs and wethers. The large majority of the surplus wether stock go to the southern counties to be finished for the butcher; but during the last fifteen or twenty years a pretty large number are fed on arable farms in Forfar and Kincardine, on grass, turnips, hay, cake, and grain.

Throughout the arable districts of both counties a large number of sheep of different kinds are reared and fed. A good many arable farmers also hold grazings; and in addition to wintering their hogs on their arable land, also feed on it a number of their wethers. Other farmers, who have no hill grazings, buy in wethers for feeding; while a still larger number breed for themselves a lot of cross-bred lambs. Some buy in cast blackfaced ewes early in autumn, and from these and Leicester tups, rear greyfaced lambs, which they fatten and send to the butcher in June and July. The ewes are also highly fed all the time, and are usually fit for slaughter within a month after the lambs leave them. A number of farmers have for some years been rearing a very fine class of lambs from half-bred ewes and Shropshire tups. With this kind of stock Mr Buttar, Corston, has been exceptionally successful. He buys in about 200 cast half-bred ewes (crosses between Cheviot ewes and Leicester tups) at the St Boswell sales about the middle of September, taking care to select those hailing from high-lying sound land. When taken home they are dipped and put on clean pasture, not too luxuriant at the outset. For about a

month or so before the rams are let loose, and during all the time they are out, the ewes are kept on the best grass on the farm, a little rape being provided for them when possible, the object being to put the ewes into a rapidly improving condition at the rutting season. This, Mr Buttar finds, has a powerful influence in increasing the crop of lambs. When within about six weeks of the lambing time the ewes get a supply of turnips, about 1 ton to the 100 ewes per week; when turnips are scarce, a little bran or brewer's grain is given. The ewes are thus strong for the lambing and full of milk, which gives the lamb an excellent start. During the whole season the extra food is continued, each ewe and its lambs getting, in boxes on the fields, about 2 lbs. a day of a mixture of bran, linseed, and cotton cake, and some bruised oats. By this liberal system of feeding, the ewes and lambs fatten at the same time, and go away together, the last being usually sent away about the end of June or first of July. The cost of the feeding from the time the ewes are bought in, say the 15th September to the end of January, is about 4d. a head per week, and from the 1st of February to the end of June, by which time both ewes and lambs have been fed and slaughtered, about 1s. a week for each ewe, including what the lambs consume. In a specially good year two lambs are reared for every ewe; this was done on Corston last season; but the average is about three lambs for every two ewes—300 lambs for 200 ewes. The lambs sell at an average of about £2 a head; they often bring more; while, including the wool, the ewes bring about 10s. a head more than their purchase price. This would give an income from the 200 ewes of about £700 to meet feeding and other expenses—a profitable transaction certainly. And in addition to this, it should be remembered that, through such liberal feeding on the fields, the land must be greatly enriched. Mr Buttar keeps about fifty pure-bred Shropshire ewes, and rears his own tups. From experience he has been led to use none but tup lambs among his half-bred ewes, allowing one tup for every 30 ewes. Several other farmers throughout the two counties also pursue a liberal and skilful system of rearing and feeding cross-bred ewes and lambs, and as a rule it leaves a satisfactory profit.

In Forfar there are several very good flocks of Border Leicesters, notably those belonging to the Earl of Dalhousie; Mr Cowe, Balhousie; Mr Goodlet, Bolshan; Mr Lyall, Old Montrose; and Mr Tailor, Red Castle, Arbroath, and others. Lord Dalhousie's flock numbers about eighty ewes, of the best strains in the country. Mr Cowe's stock, numbering over fifty, are descended from five very fine ewes, selected fifteen years ago from the flock of the Messrs Clark, Oldhamstocks. Both these flocks show excellent breeding, good shapes, and fine quality.

Mr Goodlet's flock, one of the best in the country, was established in 1863 by selections chiefly of Mellendean blood, subsequent additions being made of Courthill, Costerton, Castlemains, and Blainslie strains, while high-priced tups from the Polwarth, Blainslie, Castlemains, and Mellendean stocks have been used. The Bolshan shearling tups brought the highest average obtained at the Perth Border Leicester sale in 1880. At Kinnochtry a large and very fine flock of Border Leicesters is kept; while Mr Johnston, Cairnbeg, Laurencekirk, has a very well-bred stock, tracing mostly to the flocks at Oldhamstocks and Castlemains. At Powrie near Dundee, Mr Thomas Smith has a large and very fine flock of English Leicesters. It numbers about 120 ewes, and has been bred at Powrie for thirty-five years. Tups are introduced at high prices from the best English stocks, and the general character of the flock is indeed very high. The animals are beautifully formed, stylish, and of very fine quality.

The rapidity with which crosses from Shropshire tups are gaining in popularity gives special importance to the few very fine stocks of pure Shropshires kept in Forfarshire. That belonging to the Earl of Strathmore is both the largest and best. Shropshires were first brought to Glamis about 1862, with the view of breeding lambs to fatten on turnips, and of seeing whether or not they would suit the climate. The trial was most successful. They were found to suit the climate well and to please the butchers admirably, being "heavy killers" and full of lean mutton. Therefore in 1867 a visit was made to the great annual sale at Shrewsbury, and twenty one-year-old ewes and a couple of rams were purchased as a foundation for a flock at Glamis. The ewes came from the celebrated flock of the late Mr Price Bowen, and were by the famous tup "Maccaroni," while the rams were bought from the Messrs Crane. In the following year another lot of twenty ewes was bought, including the first prize yearlings at Leicester; and at the same time a ram was purchased from Mr Mansell, and got by "Conservative," who was the sire of the first prize ewes at the Highland Show at Dumfries in 1878. Again, in the following year the highly-commended ram at the Royal Show at Manchester was purchased at 40 guineas, and from him was bred the first prize ram and also the first prize ewes at Kelso, and also the first prize ewes and the second prize ram at the Royal Irish Show at Belfast in 1880. In 1870 the renowned "Standard Bearer," the first prize winner at the Royal Show at Bedford, was introduced; while about the same time about forty yearling ewes were purchased, all got by the famous "Cardinal," also a first Royal winner. Then followed "Potentate," the first prize old tup at the Royal Show at Cardiff, and in 1873 a ram was hired from Mr Mansell at £105. This latter animal, after being used at

Glamis for some time, was taken back by Mr Mansell, and fed for the Royal Show at Bedford, where he carried off the first prize in the aged class. He was afterwards called "Bedford Hero," and from him was bred the first prize ram at the Royal Show at Birmingham, and also the dams of the first and third prize rams at the Royal Show at Carlisle in 1880. The next purchase was Mansell's No. 4, 1877, a tup that has done much good in the flock. In 1879 a ram named "Trouster" was bought from Mr Napper of Lochcrew, Ireland; while, in 1880, Mr Shelton's highly-commended ram at Carlisle was bought. The flock at present consists of about a hundred ewes and their produce. The rams are sold when about eighteen months old at the autumn sales. The top prices are invariably obtained. In 1879 a number of young tups were sent to the Birmingham sales, and there they also fetched the highest average. The flock is carefully kept, and is of an exceptionally high character. As already stated, the Earl of Airlie has a small flock of Shropshires, mostly descended from the Glamis flock, while others throughout the county have some good specimens of this valuable and rising breed.

It is worthy of mention that, with a pen of crosses between pure-bred Shropshire rams and half-bred ewes, Mr Buttar, Corston, carried everything before him at the Scotch and English Fat Stock Shows in 1879.

### *Swine and Markets.*

Rearing and feeding swine receive but very little attention, less, indeed, than farmers might find it profitable to bestow upon them. The following table shows that in both counties there has been a large decrease in the number of pigs kept since 1854:—

	Forfar.	Kincardine.
1854, . . . . .	8442	3395
1870, . . . . .	6516	2617
1875, . . . . .	6918	2795
1880, . . . . .	5132	2196
Decrease in Forfar since 1854, . . . .		3310
„ Kincardine „ . . . .		1199

Both counties are well provided with markets for all kinds of stock and farm produce. Trinity Muir Fair, held near Brechin, is one of the most important stock markets in the country. Auction marts, held in most of the chief centres, are now to a large extent diverting the buying and selling of stock from markets.

*Labour.*

These counties are, generally speaking, fairly well supplied with labourers of all classes. In many parts the supply is less than twenty-five years ago, but still it is not, as a whole, far short of the demand. Farmers in the neighbourhood of towns find that the factories and other works draw away many of their best labourers. One reason why town work is preferred to farm labour is, no doubt, that in connection with the former the house accommodation is far superior to that provided on most farms. These counties are better supplied with farm cottages than most other counties in the north, excepting Ross and Cromarty, great improvement in this important respect having been effected during the past twenty-five years. There is still, however, a great deal to be done, and until the supply of cottages is considerably increased there is every prospect of the number of farm labourers continuing gradually to decline. The position of farm servants can never be anything like satisfactory until ample facilities are provided for their entering into married life. In the meantime, owing to the want of farm cottages, a very large number of Scottish farm-servants have no such prospect to brighten and elevate their lives. On all the larger farms in these counties there is less or more cottage accommodation. On some it is now ample or almost so, but on others it is greatly deficient. Perhaps fully one-half of the servants are married, and these, as a rule, live in cottages on the farms on which they are employed. When there is not sufficient cottage accommodation on the farm, the wives of the married servants have to reside in villages, perhaps a pretty long distance from where their husbands are engaged. Nearly all the single men are lodged in "bothies," a few being boarded with married men and a very few kept in kitchens. As a rule, the bothy comprises a general sitting and cooking room, and a bed-closet for every one or for every two men, with, in some cases, a small store or pantry. In a very few instances there is also a small reading room. Bothies, like cottages, have been greatly improved during the past twenty-five years, but in not a few cases they are still somewhat deficient in accommodation and comfort. As a rule, the bothies are cleaned out and the beds made every day by a woman engaged for the purpose. In some cases, however, the men, who are almost always their own cooks, also have to perform these other services. On several farms female outdoor servants also live in bothies, while on others they are lodged either in the farm kitchen or with married servants. The wages of ploughmen at present vary from £25 to £35 a year, according to the capabilities of the men, with board and lodging. The average would probably be about £28, 10s. for

general ploughmen and cattlemen, grieves and foremen with partial charge getting from £2 to £5 more. Men who are not capable of building stacks in harvest and such work get perhaps £3, £1, 10s., or £2 less. The perquisites usually consist of about 6½ bolls (140 lbs. each) of oatmeal, valued at about £7; 12 gills of new milk daily from Martinmas to Whitsunday, and 18 gills daily from Whitsunday to Martinmas, the yearly value being estimated at £7; a cart load of coals, valued at from 15s. to £1; and from 3 to 4 bolls, or from 10 cwt. to 1 ton, of potatoes, worth from £2 to £4. Only in some cases do single men get potatoes. The money value obtained by married servants for their work for a year would thus be as follows:—

Money,	£28	10	0
Cottage and Garden,	2	0	0
Meal and Milk,	14	0	0
Potatoes,	3	0	0
Coals, .	1	0	0
Total,	£48	10	0

In some cases married men are allowed the use of a cow instead of a supply of milk and other perquisites. Shepherds obtain about the same wages and terms as ploughmen. During the last three years wages have fallen about 25 per cent., but still the present rate is about 75 per cent. higher than that about 1850. Out-door female workers get 1s. 3d. per day, or 5d. more than 1850. For potato-lifting they get 2s. per day, exactly double what they obtained for this class of work thirty years ago. In harvest they receive 3s. 4d. a day, with perhaps an allowance of beer and bread once or twice a day. Women for house work get from £10 to £16 a year, with board and lodging. Farm-servants are engaged mostly for a year from Martinmas to Whitsunday; a few engage privately, but the majority attend feeing markets in the different localities. As a rule, married men remain long periods in one farm, but single men change frequently. The meals of men who live in bothies consist mainly of oatmeal brose and oatmeal porridge, but some sell a portion of their meal and buy coffee, bread, herrings, and other commodities. Married men in cottages live very similarly to married men in towns. Generally speaking, the farm-servants in these counties are sober, industrious, and efficient workmen. The Forfarshire ploughmen, indeed, are proverbial for their industry.

#### *Other Industries.*

The commercial industries of these counties, especially of Forfar, are of vast importance and of various character. We



can do no more here, however, than by a few facts and figures indicate their wide extent and great value.

There are no coal-beds in either county. There are small quantities of iron and lead, but not enough to make mining profitable. For a short time many years ago iron was quarried in Edzell and lead in Glamis and Glenesk. Both counties contain some limestone, and in various parts of Forfar it has been worked pretty extensively for agricultural and building purposes. The stone quarries are numerous. In Forfar a great many freestone quarries are worked regularly, and employ a large number of men. The stone, mostly belonging to the sandstone formation, is, as a rule, of good quality but various texture. It endures the influence of weather admirably. The ancient round tower of Brechin is built of Forfarshire freestone, and although that strange erection is supposed to have stood since the ninth century, the weather has made little or no impression upon its mason work. In some parts the slate vein formerly referred to has been worked. At Carmyllie there is a famous and very extensive pavement quarry, from which very large quantities of beautiful stone are shipped from Arbroath to many parts of the United Kingdom. The stone, a greyish-blue sandstone, is of very fine quality. At this and other quarries machinery is extensively used in cutting and dressing the stones. The proprietors of pavement quarries are finding concrete a rather formidable opponent.

Forfarshire contributes more than one-half of the total production of linen in Scotland. As early as 1727 it had the lead with 595,821½ yards, valued at £13,980, 10s., and all along it has not only maintained but even improved its position. In 1822 the number of yards of linen produced was estimated at 22,629,553. Mr A. J. Warden, in 1867, stated the number of flax, jute, and hemp factories in Forfarshire to be 108, with 7715 nominal horse power, 278,564 spindles, 11,329 power looms, and 46,571 persons employed. Of these works, Dundee had 72, while there were 18 in the Arbroath district, 6 in the Montrose district, 6 in Forfar, 4 at Brechin, and 2 at Carnoustie. In that year the total number of similar works in other parts of Scotland was 89, with 77,237 nominal horse power, 109,015 spindles, 8580 power looms, and 30,624 persons employed. There are a great many other works throughout Forfarshire, such as iron foundries, implement factories, tanneries, tobacco manufactories, breweries and distilleries, flour and meal mills, sawmills, &c. The manufactories of Kincardine are not extensive. There are several tanneries, breweries, and distilleries, and a few woollen and linen factories.

Kincardine has little or no shipping, but that of Forfar is extensive. At Dundee shipbuilding was carried on largely

even at the commencement of the present century. In 1856, when wooden shipbuilding had reached its height, there were six firms engaged in this work at Dundee. Iron shipbuilding began at Dundee in 1838, the building of wooden steamships having commenced in 1823. During 1878 twelve vessels were built at Dundee, three being sailing vessels (two of iron and one of wood) and nine steamers of iron. Their gross tonnage was 8094. In the same year a wooden sailing vessel of 104 tons was built at Arbroath, and one iron steamer of 50 tons at Montrose. The number of sailing vessels registered at Dundee on the 31st December 1878 was 150, and their tonnage 69,132, there being also fifty-one steamers with a gross tonnage of 23,934. At Arbroath there were at the same time fifty-three sailing vessels and two steamers registered, the gross tonnage of the former being 10,009 and the latter 247. At Montrose sixty-seven sailing vessels and nine steamers were registered, the tonnage of the former being 12,532 and the latter 2233. In 1878, 1308 British vessels, with a gross tonnage of 364,721, and 247 foreign vessels, having a gross tonnage of 61,293, entered Dundee harbour; while there cleared out 1261 British vessels, with a tonnage of 344,228, and 215 foreign vessels, with a tonnage of 54,469. In Arbroath 330 British and 47 foreign vessels, with a respective tonnage of 36,561 and 8306, arrived; while there sailed 328 British and 47 foreign vessels, with a respective tonnage of 36,940 and 8345. At Montrose 588 British, with a tonnage of 64,110, and 92 foreign vessels, with a tonnage of 28,516, arrived; while there sailed 576 British and 95 foreign vessels, with a respective tonnage of 60,766 and 25,952.

At the various villages and towns along the Kincardineshire coast a large number of boats are employed at herring and other fishing. The salmon fishings of the county are valuable, yielding, as they do, a rental of £7000 on the coast, £700 on the North Esk, and £450 on the Dee. The fishing-boats number in all about 524, and with the nets and lines are valued at £28,000. There are about 116,000 cod and ling taken, and of herrings about 27,000 barrels. Forfarshire derives much value from the sea. The Montrose district stands seventh in Scotland in regard to the number of boats. In 1878 the number of boats in the Montrose district was 684, the number of fishermen and boys 1218, the number of fishcureurs 41, the number of coopers 109, the value of the boats £26,389, the value of the nets £22,770, and the value of the lines £7249, making a total estimated value of £56,408. The barrels of herring cured or salted in the same year numbered 29,936, while there were 93,034 cod and ling taken partly by vessels and partly by open boats.

ON THE OLD AND REMARKABLE BEECHES (*Fagus sylvatica*)  
IN SCOTLAND.

By ROBERT HUTCHISON of Carlowrie.

[*Premium—The Gold Medal.*]

It is somewhat remarkable that there should be so few recorded instances amongst old writers of large beech trees in Scotland, considering the wide distribution which this tree has attained, and that it is so general over the country at the present day.

Dr Walker, who wrote his Catalogue, "after forty years' observation," in 1798, mentions only four examples, and one of these he gives as a remarkable tree, though it only girthed 8 feet in 1780! And in the list compiled in 1812, and published in the "Edinburgh Antiquarian Magazine" (vol. i. pp. 20-23), in 1848, only seven are stated, three of them being also identical trees with those given by Walker. From the many large specimens whose dimensions and localities are appended to the present report, we might surely have had a longer list handed down to us by those earlier observers, for many of these now given must have been in existence, and been trees of no mean circumference, when Walker wrote, unless it be that many or most of the first planted beeches in Scotland having attained timber dimensions, and their wood being found of little value for constructive or domestic purposes, had, in the absence of the mining industry of the present day, which has rendered the fuel supply independent of wood, been felled and consumed as fuel, so that probably only a few very notable examples, whose position in ornamental grounds had saved them, remained to testify how admirably suited for extensive development of trunk and bole the beech tree is, in almost every soil and situation in Scotland. Loudon, in his great work, throws very little light on the cause of this apparent paucity of very notable beeches in Scotland. He does not mention individually any fresh examples beyond those given by Walker, excepting one (since blown over) at Prestonhall, Midlothian. He incidentally, however, mentions that "a number of other fine beech trees existed in Scotland in Walker's time," and that "Mr Sang and Sir T. Dick-Lauder have added several other remarkable examples." From these statements it would appear that about the beginning of the present century, few of the old and originally planted beeches survived in Scotland, but that a copiously planted crop, introduced extensively about the time of the Revolution, was then forming considerable timber, and is now to be traced out in such tracts as those we find in such woods, of which beech trees form a main feature, as may be seen at Inveraray, Ormiston, Hopetoun, Craigiehall, Hawthornden,

Binning Wood, Dunglass, Blairdrummond, and many other districts of Scotland, where large and fine specimens exist in quantity, and in luxuriant foliage, at the present day. We must accordingly look upon the examples of Walker and other early writers as very likely to be contemporaries pointing to a more remote period of introduction, dating probably back to the years from 1540 to 1560.

These remarkable beeches mentioned by the earlier writers referred to, are all single or standard specimens, and appear to have been selected for their several sites solely with a view to ornamental or picturesque effect.

Indeed, the adaptation of the beech for such purposes seems to have been very prevalent with its planters about the beginning of the 18th century, to which date are to be ascribed most, if not all, of the stately and imposing avenues and "walks" or "rides" of beeches, which are the glory and beauty of many sylvan retreats at the present day. Many of the dimensions of the most notable of these grand objects of landscape gardening are given in the appendix to this report, and a comparison of their girths and lengths of bole are deeply interesting, and a brief reference to some of these particulars may here be made. At Logie-Almond, Perthshire, the old main approach to the mansion-house runs through a fine old avenue of beech, lime, and elm trees, and is perhaps one of the finest old avenues in Scotland. Through the kindness of Mr William McCorquodale of Scone Woods we have been able to give the particulars of two of the best beeches in this avenue in the appendix, and it will be seen that they girth respectively, at 5 feet from the ground, 15 feet 3 inches and 11 feet 9 inches, with massive boles of nearly 30 feet in length. These noble specimens have been hitherto unrecorded. While Morayshire generally abounds in fine examples of beech, the trees at Brodie Castle are worthy of special note. The principal approach leading to the castle is lined on each side with a row of beeches, forming an avenue of rare grandeur in summer, when in full foliage. There are also many fine lawn specimens of large size. These trees were planted between the years 1650 and 1680, and are growing in a black sandy loam, on a subsoil of white sand and clay. Two of the largest and finest of the Brodie trees girth respectively 14 feet 8 inches and 18 feet at 1 foot, and 11 feet 9 inches and 15 feet 3 inches at 3 feet above ground. Another beech at Earlsmill, on the same estate, and mentioned by Sir T. Dick-Lauder as girthing, in 1812, 15 feet at 3 feet from the ground, now measures (1879) 17 feet 10 inches at 1 foot, 16 feet 3 inches at 3 feet, and 15 feet 11 inches at 5 feet from the base. Sir T. Dick-Lauder, in a MS. note on a volume of Walker's "Essays," which had been in his possession, states that "another beech at Elgin, in a garden, is

but a few inches less." This tree, however, notwithstanding diligent inquiry last year, we have been unable to identify."

But, returning to notice the planting of the beech in formal lines for picturesque effect, we need only refer to many beautiful avenues in other counties of Scotland, for illustrations of them are familiar to every lover of trees and the picturesque. The beauty and stately grandeur of the beech avenue at Freeland, Perthshire, is well known. The trees in this avenue girth from 12 feet to 17 feet 6 inches at *breast high*, and are in healthy vigour. A very good representation of formal planting in line is found in a row of beeches of large and imposing dimensions near Stanley, Perthshire. One tree in this group, conspicuous by its massive trunk covered with smooth silvery bark, is 83 feet in height, with a bole of 45 feet of measurable timber, and girths 15 feet 8 inches at 1 foot, and 14 feet 7 inches at 5 feet above ground. The practice of utilizing the beech, from its hardihood and power of resisting the blast and affording shelter along exposed roadsides, was very common, and its use as a screen was frequently resorted to. In high situations, or in wide untimbered tracts, its use as a hedge for such purposes is also not uncommon. Its adaptation to shelter, and as forming a roadside avenue to protect from the fury of the winter's blast, or to shade from the sultry heat of summer, is well illustrated by the well known beeches on the road between Dunkeld and Pitlochry, Perthshire. Another beautiful and highly picturesque beech avenue exists at Moncrieffe, Perthshire. It is about 700 yards in length, and the trees average 10 feet 6 inches at *breast high*, many being above that circumference. This avenue, it is supposed, was originally a hedge planted about the time of the building of the present mansion-house at Moncrieffe, in 1679, and gradually thinned out as the plants required more space. In the centre of this avenue there are the interesting remains of a group of standing stones, commonly called "Druidical Circles," so frequently met with in several districts of Scotland. At a high altitude in the Ochils, at Glendevon, in light gravelly loam on gravel subsoil, close to the banks of the Devon, there is another fine old beech avenue about 300 yards in length. The trees stand in too close proximity to each other to admit of their free development, but they girth from 7 feet to 9 feet 6 inches at 3 feet above ground, and form a good test of the ability of the beech to thrive and grow into timber dimensions at so high an altitude, being 800 feet above sea-level. Other single beeches are found at equally if not higher altitudes, as at Cleish Castle, 580 feet, where it will be observed from the returns in the appendix, that it girths in many cases 17 feet and 17 feet 6 inches at 1 foot, and from 10 feet to 13 feet 6 inches at 5 feet above ground, with tall handsome boles;—and at Dolphinton, Lanarkshire, at 834 feet altitude, it girths 10 feet

7½ inches at 5 feet from the base. The fine beech avenue at Inveraray Castle is too well known to require more than a passing reference. As a single tree in the park at Inveraray Castle, the beech girths in some cases 14 feet 3 inches at 5 feet from the ground. The soil is a brown loam over a sandy gravel subsoil. Another picturesque beech avenue existed formerly at Braid, near Edinburgh, but has unfortunately been suffered to pass away unrecorded, having been cut down several years ago. Handsome lines of beeches also may be noticed at Blairdrummond, Perthshire, where one beech measures 90 feet in height, 20 feet of bole, and girths 16 feet 10 inches at 1 foot, and 15 feet 9 inches at 3 feet above ground. Also, at Ardkinglas, Argyllshire, where a beech girths 16 feet 8 inches at 3 feet from the base. Many other fine specimens are to be found at Ardkinglas; some of the finest of these are given in the appended returns. This splendid tree is 92 feet in height, and girths at 3 feet from its base 18 feet 10 inches, and 18 feet 9½ inches at 5 feet. It grows in black loam upon a gravelly till subsoil, and has a diameter of spread of branches of 108 feet. It is locally known by the name of "Prince Charlie's Beech." Why it has been so called, there are no reliable data to show,—but, although there is no historical record of the young Chevalier having ever resided in the neighbourhood, or even having passed through it in his wanderings, the tree may have probably been so christened by a Highland chieftain and follower of Prince Charlie, who is said to have sheltered a number of the Prince's adherents under its umbrageous foliage, accommodation for them being otherwise unobtainable. Such, at all events, is the legend of this truly majestic specimen. In Bute, one of the most attractive objects to arboriculturists, is the "Beech Walk." It is situated at Mountstuart, in the parish of Kingarth; and, from the account of the district and its trees, kindly furnished by Mr Kay, the estate forester, we learn that it lies at the bottom of the ancient sea-cliff, and extends to 570 yards in length, with a width of 12 yards. The average space between the trees is 11 yards, and their extreme height is 120 feet. These trees, in their formal habit of growth and planting, resemble a majestic colonnade of architectural pillars, which, with their interlacing branches overhead, present the appearance of a vast Gothic arch when viewed from one end. Many of the trees are upwards of 10 feet in circumference at 5 feet from the ground. The largest is 11 feet 9 inches at 5 feet up, and is 60 feet in length of bole to the first branch, and will contain 450 cubic feet of timber. The soil is sandy and subsoil sand, being an ancient sea-beach; altitude of the site 20 feet, and the exposure is to the east, but is somewhat sheltered. This interesting "Beech Walk," shows the suitability of this tree for planting in similar sites along sea-margins, and

as the climate of such situations in the west of Scotland is well known to be extremely mild and salubrious, we may perhaps notice the success which has attended the planting of the beech in corresponding situations on the eastern and less sheltered coasts of Scotland; and here, too, we are fortunate in being able to point again to instances of formal planting in lines and avenues, which have not only proved extremely satisfactory to their noble planter and his successors, but form a feature at the present day in the district. The beech avenues at Tynninghame, East Lothian, are extensive and numerous. The principal west avenue is formed by a closely planted interlacing double row of large and well-developed beeches, from which another side avenue branches off about 300 yards apart in a straight line for fully 600 yards, and forms a delightfully picturesque colonnade of dark verdure in summer. The rides in Binning Wood also, which adjoins the policy of Tynninghame, are magnificent examples of the formal style of planting so much in vogue during the early part of last century. The situation is quite near the sea, and fully exposed,—the soil is light sandy loam upon sand, and in some places clay subsoil, and from reference to six beech trees, the dimensions of which are given in the appended returns, it will be seen that they are about 80 feet in height, with boles reaching to 40 feet in length, and, girthing, at 1 foot from the base, in some cases from 17 feet 8 inches to 20 feet 3 inches, and from 12 feet 10 inches to 13 feet 9 inches at 5 feet from the ground. These six examples may be taken as fair representatives of thousands of others in this beautifully and well-arranged demesne. It is to the enterprise of Thomas, sixth Earl of Haddington, that the district owes its present sylvan supremacy over other parts of the county. In 1705, immediately previous to the Union, he entered upon very extensive planting operations, and his well-directed labours are now seen in the magnificent specimens above referred to. Binning Woods were enclosed in 1707, so that the trees given in the appended return are now 173 years old, and are still in pristine vigour. The beech drives in Binning Wood are so arranged that they converge to a centre like the radii of a circle, each parallel having the appearance of the vaulted aisles of some grand Gothic cathedral, canopied with living green verdure, and with a mossy carpet of velvet turf. Altogether, the enclosed plantations on Tynninghame extend to about 800 or 900 acres. Tree planting with Earl Thomas was a favourite passion, communicated in a great measure to him by his Countess, who was an enthusiastic tree lover, and he indulged his fancy with discrimination and taste no less than with consummate skill in the selection of site, and description of tree suited to it. The very sea-shore was skilfully included in his operations, and many umbrageous specimens now luxuriate almost down to water-mark on the eastern outskirts of these woods

Similar instances of the suitability of the beech to thrive in a thin and cool soil, near the sea, are afforded by the trees at Broxmouth Park, near Dunbar, and at Dunglass, on the borders of Berwickshire, and quite close to the sea, where in a *dene* running up from the sea, there are on either of its steep banks many large and handsome specimen trees. Some of the best examples of these in this locality are given in the appended returns. Likewise, the beech is found in large numbers, and of great size, all along the coast of Forfarshire about Carnoustie, and thrives there admirably within  $4\frac{1}{2}$  miles of the open sea, producing timber of first-rate quality. At Kinnaird, in that vicinity, the largest and probably the oldest beech was blown over by the Tay Bridge Gale of 28th December 1879. It measured 86 feet in height, and forked into two large upright limbs at about 3 feet from the ground, where it was found to girth 18 feet 4 inches. It contained 316 cubic feet of timber, and the rings of annual growth numbered 240, the section having been carefully dressed with a plane before these were counted. The other two beeches from Kinnaird, mentioned in the appended returns, appear to be of the same age. On the estate of Gray, also in Forfarshire, there are hundreds of very fine beeches, very healthy and thriving and of great size, averaging from 160 to 220 cubic feet of timber each. The one given in the returns, containing 206 cubic feet of timber, stands to the south of Liff burying ground, and west of the old manse of Liff.

"The Dark Avenue," at Hopetoun, is another very fine and notable instance of the peculiar suitability of the beech for planting in lines to form an effective and grateful sylvan retreat.

Before passing from noticing so many interesting groups and lines, or avenue arrangements, of the beech in Scotland, to the consideration of individual immense trees in various localities, we must not omit to notice one singularly fine example of this artistic disposition of the tree, which has come to our notice at Sorn Castle, Ayrshire. Here, at a high elevation, on a naturally thin soil (to which the beech is best adapted, and on which it produces the finest timber), upon a stiff clay subsoil, beeches form a very attractive feature, and thrive well amongst other varieties of hard wooded timber trees such as oaks and English elms. "The Beech Walk" there, containing sixty-six trees, and extending 370 yards in length, forms another of those very beautifully shaded avenues to which reference has been so copiously made in this report. This stiff and formal style of planting of the early part of last century seems to have developed itself in the district very generally. It is to the Dowager Countess of Loudon of that period that Sorn Castle owes so much of its landscape beauty. This noble lady's love for trees and taste for planting were most enthusiastic, and hence the wealth of old English elms (which appears to have been her favourite tree) and beeches with which



Sorn abounds. It is related of her ladyship that, when she heard of Dr Johnson's cynical remarks on the nakedness of Scotland in regard to trees, she exclaimed "Deil tak' the man, whaur was his e'en, when he didna' see my Elms"!!! These beech trees grow at various altitudes from 350 to 430 feet above the sea-level, and girth from 9 to 10 feet at 5 feet from the ground, with lofty boles, in some cases reaching 30 feet in length.

We must now, however, hasten to notice a few of the most important single specimen beeches in various parts of the country. Foremost amongst these, and *facile princeps*, the most magnificent beech, and at the same time the largest tree in Scotland, is the Newbattle Abbey beech, Midlothian. This splendid monarch grows in a deep light sandy loam, upon an open gravelly subsoil. It is 95 feet in height, and at 1 foot above ground girths 37 feet 3 inches,—at 2 feet it is 25 feet 3 inches, and at 5 feet its trunk girths 21 feet 2 inches, and it is still growing and making more wood annually. Measured carefully in 1879, it girthed at 2½ feet above ground 27 feet 10 inches; at 7 feet, 19 feet 1½ inch; and at 34 feet from the ground, after giving off many immense limbs, its trunk still girthed 17 feet 10 inches. The circumference of the spread of its branches is 350 feet. At about 15 feet from the base the large overhanging limbs begin to spring from its colossal bole, and these have long ago reached the ground, into which several of them are firmly rooted and are growing upwards and outwards with redoubled vigour, while at the same time they form so many natural buttresses to the support of the mighty trunk. The tree has been frequently measured, and appears to have made an inch in girth on an average annually for the last fifteen years. Dr Walker notices this tree, as one of the four in his Catalogue to which we have referred. He says: "The large beech at Newbottle Abbey, standing on the lawn behind the house, on 6th July 1789 measured 17 feet." His measurements were taken apparently at 3 feet from the ground, although in this instance he does not mention the particular point. It was then, he states, a vigorous and healthy tree, with an immense head. The span of its branches was 89 feet. He records also that a beech, at Taymouth, of a like size, and seemingly coeval with this, was overturned by a storm some years previously, when it had arrived at above 16 feet in girth. Would that the worthy Divine had seen the Newbattle beech at the present day! Probably the next beech in Scotland in point of size and magnitude is at Eccles, Dumfriesshire, which measures now upwards of 20 feet in girth at 5 feet above ground. In 1863, its dimensions were,—girth, 26 feet at 2 feet above the ground; 20 feet at 4 feet; 25 feet at 7 feet; and 17 feet at 16 feet from its base. The height of this tree was then 65 feet, and the spread of branches was 300 feet in circum-

ference. The altitude of the site is 430 feet, and exposure to the south-east. Another beech little inferior to this one stood near it, but was unfortunately destroyed by a gale some years ago. Neither of these trees is mentioned by Dr Walker. Next in point of magnitude, so far as our researches show, is the beech tree at Belton, East Lothian. This tree is 63 feet high, with a bole of 31 feet, and girths at 1 foot above ground 32 feet 3 inches, and 20 feet 4 inches at 5 feet. In 1863, this tree is recorded to have been 19 feet 4 inches at 6 feet from the ground and 17 feet 8 inches, at 9½ feet. Its age is stated to be about 150 years, but this seems much too short a space of time for it to have attained these dimensions. About sixty years ago, almost one-half of its trunk on the west side of the tree was carried away by the falling of a large branch, and twenty years afterwards the cavity caused by this accident in the centre of the trunk was large enough to contain three men. It is, however, now very much closed up, and fresh wood is being rapidly formed from a shoot of healthy bark, which must before long quite enclose and hide the cavity. On the east side of its base is a curiosity in the projecting corner of a large stone trough, which in former times had stood at the root of the tree for watering cattle, but over and around which the conoidal base of the trunk has now grown, so that the trough is quite imbedded in the heart of the bole, and only a small portion of the brim of it is visible! The next recorded beech probably, in point of importance at the present day, is the Balmerino Abbey tree, Fife. There are two large and venerable specimens there, and they measure as follows:—

	Height.	Bole.	Girth at 5 ft.	Girth in 1863.	Girth in 1793.
No. 1.....	95 ft.	35 ft.	13 ft. 9 in.	13 ft. 0 in.	...
No. 2.....	92 ft.	30 ft.	14 ft. 11 in.	14 ft. 7 in.	12 ft. 7 in.

The trunk of No. 1 divides into limbs at 35 feet, and its bole is much finer than that of No. 2, as it presents its thickness almost uniformly up to the spread of its branches, and contains a greater amount of timber than No. 2, which tapers a good deal. Both trees are still perfectly sound and healthy, and are magnificent objects when in leaf. These trees are not noticed in Walker's Catalogue, but No. 2 is recorded in the list of trees dated 1812, and which appears in the "Edinburgh Antiquarian Magazine," vol. i. pp. 20 and 23, published in 1848.

A beech at Leslie House, Fife, which in March 1812 girthed 11 feet at 3 feet from the ground, with a lofty bole of 56 feet, now measures 16 feet 8 inches at the same point, and is probably

the next in point of size of the old recorded trees. The beech at Kellie Castle, growing in the garden, and in inquiring after which we supposed we were tracing out at the present day, the condition of a beech stated to be growing there in the 1812 list, and to be then 16 feet in girth at 3 feet from the ground,—we find to be now 18 feet in circumference at that point. It appears to be still in a pretty good state of preservation, although the main branches of it were broken off by a gale many years ago, and the tree is thus much shorn of its symmetry. As, however, the bole of the tree given in the record of 1812 is stated to be 30 feet in length, and the actual measurement now of the tree we refer to is only about half that length, there may be some mistake in the identity of this tree with that catalogued in 1812, as having girthed, in 1793, 16 feet. It was also ascertained in the course of inquiry regarding this tree, that the remains of several old beeches had recently been removed, and, in particular, of one of a large girth between the castle and the turnpike road. Further there are now no other very large or venerable beeches at Kellie Castle, excepting the one in the garden above referred to. The celebrated beech tree at Ormiston Hall, East-Lothian, which, according to Walker, measured, on 10th May 1762, 18 feet 10 inches at 3 feet from the ground; and the large beech at Oxenford, Midlothian, which he states on 6th June 1763 girthed 19 feet 6 inches at 3 feet from the ground, have both long since disappeared; but the most careful inquiry regarding these two veterans fails to throw any light on either the date or the manner of their destruction.

So much for the tale at the present day of those old recorded beeches, which, after much investigation, we are able to give. Time would fail to describe the best specimens of existing and hitherto unrecorded trees, such as those given in the appended returns, to which for all particulars therefore, reference must be made. Before concluding, it may be perhaps proper to notice a peculiar habit of the beech, developed in several localities, of assuming a spiral columnar growth of trunk near the base, where the conoidal swellings assume a most picturesque oblique buttress-like appearance. This is well illustrated in a beech tree growing at Freeland, Perthshire. Another peculiarity of the beech is its tendency to inarch, or naturally graft its limbs one upon another, producing frequently the most fantastic freaks of nature. Thus, at Dunkeld, in the Athole woods, we find a beech which presents the appearance of growing straight upwards till at about 5 feet from the ground, it seems to split into two, and to join again about 4 feet higher up, the two stems becoming incorporated by a process of natural grafting. In that locality there are many fine beech trees, of which we have given records in the appendix.

The principal variety of the *Fagus sylvatica* or common beech, is the purple or copper-leaved variety, as it is frequently termed. Of this we have given several fine examples in the appended returns, as for example, at Gordon Castle, Morayshire, where it has reached a height of 65 feet, and girths 11 feet 8 inches at 1 foot, and 8 feet 10 inches at 5 feet from the ground; at Dunkeld House, where there is a very handsome specimen, now 53 feet in height, and 10 feet 7 inches in circumference at 3 feet from the base; at Moncreiffe House, Perth, where it is 62 feet in height, and girths 9 feet at 1 foot from the ground, and 7 feet 8 inches at 5 feet up; at Dollarfield, where it is 63 feet high, with a bole 40 feet long, and girthing 8 feet 4 inches and 7 feet 4 inches at 1 and 5 feet from ground respectively, and with a spread of branches of 70 feet diameter; at Carlowrie, Linlithgow, where it is now, with a wide flat-spreading head, 65 feet in height, bole 18 feet in length, 8 feet 9 inches in girth at 1 foot, and 7 feet 6 inches at 5 feet from the ground; and at Biel, East Lothian there is a fine specimen 60 feet high, 12 feet of bole, and 9 feet in girth at 1 foot, and 8 feet at 5 feet from the ground. The purple beech is a native of Germany, where it was accidentally discovered in a wood, between the middle and end of last century; and the original parent tree, from which all the purple beeches in the country have been produced, is said to be still standing.

From the foregoing report, and further reference to the appended returns, it will be observed that the beech, which cannot be said to be indigenous to Scotland,—although it is said to be so in some of the midland and southern counties of England, and old authors quote it as one of the four aboriginal hard-wood trees of the country,—thrives best and attains its largest dimensions more rapidly in soils that are thin and light, or in the calcareous loams of the chalk formation. It thrives also, as many of our statistics show, on sandy and clayey loams at great altitudes, and grows indeed more freely in such soils and situations than most other hard-wood trees. In some of the central parts of England, where that great ridge of chalk hills, which occupies a large portion of several midland counties, exists, the beech occurs as a natural forest, to the exclusion of all other varieties of trees, by its far stretching roots, and depth of shade, which effectually kills them off. As shelter on high-lying or bare and exposed fields, whether under crop or in pasture, it is invaluable when planted in strips, or as a hedge, and as a park tree planted for ornament, the references we have endeavoured to give in this report will show that the beech has few equals among forest trees in Scotland, and has been appropriately styled by an eminent writer on arboriculture, “at once the Hercules and Adonis of our Sylva.”



BEECH (*Fagus sylvatica*).

Height of Tree.	Length of Bole.	Present Circumference of Trunk at			Any former recorded Measurements and Dates.			Diameter of Spread of Branches.	REMARKS.
		1 foot.	3 feet.	5 feet.	Date.	At 1 Foot.	At 3 Feet.		
Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.		Ft. in.	Ft. in.	Ft. in.	
75 0	34 0	14 0	13 0	12 3	1866	13 0	...	70 0	
78 0	16 0	16 0	15 8	14 3	1866	...	14 0	80 0	
98 0	16 0	17 6	13 10	...	...	...	...	73 0	
95 0	25 0	17 3	13 7	...	...	...	...	64 0	
95 0	12 0	14 10	11 11	...	...	...	...	75 0	
82 6	24 0	14 8	11 9	...	...	...	...	...	A very symmetrical tree.
81 0	20 0	13 11	12 7	} ...	...	...	...	...	{ These trees were planted between the years 1650 and 1680.
80 0	23 0	14 9	11 11						
72 0	17 0	15 2	11 10						
81 0	20 0	18 0	15 3						
65 0	20 0	17 10	16 3	15 11	...	...	...	90 0	{ In 1812, Sir T. D. Lauder measured this tree 15 ft. at 3 ft. Highly ornamental.
75 0	...	18 11	...	14 8	...	...	...	65 0	
65 0	...	11 8	...	8 10	...	...	...	65 0	{ A fine specimen of copper-leaved beech.
90 0	23 0	20 6	...	15 3	...	...	...	...	In 1869, girthed 20 ft. at 1 ft. up.
84 0	25 0	22 6	...	14 0	...	...	...	...	
75 0	18 0	22 9	...	17 3	...	...	...	...	
65 0	16 0	16 10	...	14 3	...	...	...	...	
60 0	40 0	15 6	...	12 4	...	...	...	...	
72 0	22 0	16 10	...	12 1	...	...	...	60 0	Cubic contents of bole 166 ft.
75 0	20 0	20 4	...	14 4	...	...	...	68 0	
86 0	3 0	18 4	...	...	...	...	...	...	{ This tree fell in the Tay Bridge Gale of Dec. 1879. It had 240 annular rings.
75 0	33 0	12 6	...	9 10	...	...	...	...	Cubic contents of bole 206 ft.
84 0	25 0	...	...	11 9	...	...	...	...	{ In old avenue leading to Logie-Almond House.
90 0	30 0	...	...	15 2	...	...	...	...	{ Growing in a <i>dene</i> at east end of avenue.
95 0	45 0	14 6	11 11	11 8	...	...	...	...	{ Grows at west gate.
80 0	50 0	9 6	9 0	8 6	...	...	...	...	{ In park, on side of avenue. Remarkable for its very clean bole of 50 ft.
85 0	35 0	15 2	11 11	10 9	...	...	...	...	{ In park—side of avenue.
90 0	25 0	14 6	10 9	10 4	...	...	...	...	{ A very umbrageous specimen.
53 0	...	...	10 7	...	...	...	...	...	{ A fine copper-leaved variety.
85 0	10 0	18 4	17 10	...	...	...	...	...	
97 0	28 0	15 9	...	11 0	...	...	...	...	
97 0	27 0	16 3	...	10 8	...	...	...	...	
101 0	28 5	15 0	...	10 3	...	...	...	...	
77 0	10 0	20 11	...	17 8	...	...	...	...	
71 0	9 0	29 0	...	15 11	...	...	...	105 0	
88 0	12 0	23 0	...	14 10	...	...	...	...	
88 0	29 0	20 0	...	13 11	...	...	...	...	
56 0	...	4 10	...	...	...	...	...	39 0	Fine thriving purple variety.
77 10	20 10	15 0	...	13 7	...	...	...	114 0	
85 6	16 6	15 11	...	13 0	...	...	...	108 0	
63 0	15 0	10 0	...	6 6	...	...	...	62 6	{ Very handsome purple variety.
74 0	48 0	10 6	...	8 2	...	...	...	...	{ Do. do.
50 0	25 0	8 8	...	7 10	...	...	...	68 0	
70 0	30 0	9 5	...	7 5	...	...	...	78 0	
60 0	33 0	8 10	...	7 10	...	...	...	42 0	
60 0	12 0	9 10	...	9 2	...	...	...	50 0	On Hatton roadside.



## BEECH—continued.

Height of Tree.	Length of Bole.	Present Circumference of Trunk at			Any former recorded Measurements and Dates.			Diameter of Spread of Branches.	REMARKS.
		1 foot.	3 feet.	5 feet.	Date.	At 1 Foot.	At 3 Feet.		
Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.		Ft. in.	Ft. in.	Ft. in.	
60 0	14 0	9 9	...	9 1	...	...	...	54 0	On Hatton roadside.
55 0	13 0	13 2	...	11 5	...	...	...	69 0	Do. do.
40 0	9 0	13 10	...	13 0	...	...	...	60 0	Do. do.
40 0	11 0	10 4	...	10 0	...	...	...	60 0	Do. do.
88 0	6 0	13 0	...	11 6	...	...	...	74 0	{ Planted in 1750.
73 0	6 0	16 0	...	13 10	...	...	...	97 0	Do.
73 0	6 0	15 0	...	11 0	...	...	...	70 0	Do.
80 0	...	13 4	10 11	10 3	...	...	...	...	
76 0	20 0	8 10	...	7 8	}	...	...	...	{ These are growing in an avenue of beeches, closely planted and very picturesque, leading along the side of the Devon to Glendevon House, and are a fair average of about 100 trees in this high altitude.
87 0	40 0	8 5	...	7 1		...	...	...	
95 0	60 0	5 10	...	4 7		...	...	...	
78 0	13 0	9 5	...	9 3		...	...	...	
86 0	9 0	15 3	...	14 8	...	...	...	110 0	
82 0	11 0	13 0	...	17 6	...	...	...	130 0	
62 0	...	9 0	...	7 8	...	...	...	60 0	{ A beautiful purple-leaved variety.
...	...	...	...	...	...	...	...	...	{ A magnificent beech avenue of over 30 trees, girthing from 12 ft. 6 in. to 17 ft. 6 in. at 3 ft. from the ground, and quite vigorous.
87 0	...	15 3	15 0	...	...	...	...	...	{ A very picturesque tree with curious twisted branches. Many more similar in dimensions.
90 0	16 0	13 10	...	15 9	...	...	...	...	{ A very handsome noble tree: In 1863, girthed 18 ft. 7 in. at base and 15 ft. 10 in. at 3 ft. up. Many others of a similar and even larger girth.
...	...	...	...	...	...	...	...	...	{ A line of twelve fine specimens, averaging 11 ft. at 3 ft. One remarkably clean bole girths 15 ft. 8 in. at 1 ft., and 14 ft. 7 in. at 5 ft. and is 45 ft. in length.
85 0	20 0	16 4	14 5	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	{ Many hundreds of fine large specimens, in many places forming quite an avenue densely branched overhead.
60 0	23 0	24 0	...	16 0	...	...	...	...	
85 0	20 0	13 6	...	10 4	...	...	...	...	
107 0	13 0	17 6	...	13 6	...	...	...	...	
75 0	13 0	15 0	...	10 7	...	...	...	...	
88 0	26 0	17 6	...	12 0	...	...	...	...	
90 0	25 0	15 4	...	11 6	...	...	...	...	
74 0	24 0	16 6	...	10 0	...	...	...	...	
85 0	25 0	17 0	...	12 0	...	...	...	...	{ Divides into two immense limbs at 18 ft.



## DESCRIPTION-OF THE

County.	Place.	Altitude above Sea-Level.	Soil.	Subsoil.	Exposure of Site.
Kinross,	Cleish Castle,	Ft. in.	Light clayey loam,	Clay and gravel,	...
"	"	...	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
"	Kinross House,	...	Thin poor soil,	Damp clay,	...
"	Burleigh Castle,	...	...	...	...
Clackmannan,	Tillicoultry House,	...	Sandy loam,	Gravel and sand,	Sheltered,
"	"	...	"	"	"
"	Dollarfield,	...	Good loamy soil,	Gravel,	"
Stirlingshire,	Leckie,	...	Gravelly soil,	Red freestone rock,	W.
"	"	...	"	"	W.
"	Dunipace House,	...	Clay loam,	Clay and till,	W.
Clackmannan,	Tullibody,	70 0	Clayey,	Red clay,	S.
Fife,	Otterstone,	100 0	Light loam,	Clay and gravel,	S.
"	Donibristle,	80 0	Light sandy loam,	Sand,	S.
"	Kellie Castle,	100 0	Light loam,	Gravelly,	S.
"	Leslie House,	300 0	"	Sandy,	...
"	Balmerino Abbey,	50 0	"	Gravelly,	S.
"	"	50 0	"	"	S.
Argyll,	Inveraray Castle,	...	Brown loam,	Sandy gravel,	N.E.
"	Ardkinglas,	100 0	Black loam,	Gravelly till,	...
"	"	...	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
Bentrewahire,	Shawholm,	100 0	Dry loam,	Sandstone,	S.W.
"	Pollok,	120 0	"	"	S.W.
"	"	"	"	"	S.W.
"	Cannis Ekan,	50 0	Light sandy loam,	Gravel,	...
"	Hawkhead,	...	Medium loam,	Gravelly till,	...
"	"	...	"	"	...
"	"	...	"	"	...
Ayrshire,	Loudon Castle,	250 0	Loamy,	Sandy clay,	N. and S.
"	"	157 0	Sandy loam,	Sand and gravel,	S.W.
"	"	240 0	"	"	S.
"	{ Kirkmichael, Maybole, }	...	Light sandy,	Gravel,	...

## BEECH—continued.

Height of Tree.	Length of Bole.	Present Circumference of Trunk at			Any former recorded Measurements and Dates.			Diameter of Spread of Branches.	REMARKS.
		1 foot.	3 feet.	5 feet.	Date.	At 1 Foot.	At 3 Feet.		
Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.		Ft. in.	Ft. in.	Ft. in.	
95 0	50 0	12 8	...	11 0	...	...	...	...	
100 0	30 0	18 0	...	10 8	...	...	...	...	
98 0	33 0	13 8	...	8 10	...	...	...	...	
96 0	24 0	14 6	...	10 9	...	...	...	...	
100 0	36 0	17 0	...	10 6	...	...	...	...	
98 0	...	16 0	...	14 10	...	...	...	85 0	
...	...	...	...	...	...	...	...	...	Many large and well-grown beeches of considerable height (80 to 90 ft.), and girthing on an average 12 ft. at 5 ft. from the ground.
78 0	...	14 10	...	11 11	...	...	...	...	Growing in the park.
80 0	...	15 9	...	13 6	...	...	...	...	Do. In 1863 girthed 15 ft. 2 in. at 1 ft. up.
63 0	40 0	8 4	...	7 4	...	...	...	70 0	A very handsome copper-leaved variety.
80 0	24 0	11 8	...	8 10	...	...	...	...	
83 0	36 0	9 3	...	7 6	...	...	...	...	
70 0	12 0	15 9	...	13 7½	...	...	...	...	
100 0	20 0	21 2	16 6½	13 10	...	...	...	...	(One of an avenue of 14 similar beeches. Measured 14 ft. 5 in. at 3 ft. in 1870. Another similar was blown down in a gale 6 years ago.)
90 0	32 0	17 0	...	15 6	...	...	...	...	
80 0	25 0	16 0	...	14 6	...	...	...	...	
70 0	17 0	...	18 0	...	...	...	...	...	A tree in the situation corresponding to this one in 1793 girthed 16 ft. at 3 ft. from the ground.
95 0	56 0	...	16 8	...	...	...	...	...	In 1812 it girthed at 3 ft. 11 ft.; in 1863 it girthed at 3 ft. 14 ft. 9 in.
100 0	35 0	...	...	13 9	...	...	...	...	Girthed 12 ft. 7 in. at 3 ft. in 1793; and in 1863 girthed 13 ft. 8 in. at 3 ft. Two magnificent and imposing-looking specimens.
100 0	30 0	...	...	14 11	...	...	...	...	In vigorous condition.
95 0	40 0	...	...	14 3	...	...	...	...	
80 0	...	...	13 10	...	...	...	...	70 0	
75 0	...	...	12 9	...	...	...	...	77 0	
80 0	...	...	14 7	...	...	...	...	92 0	
92 0	...	...	13 10	13 9½	...	...	...	108 0	"Prince Charlie's" beech.
92 0	...	...	15 5	...	...	...	...	108 0	
92 0	...	...	16 8	...	...	...	...	108 0	
75 0	...	...	10 9	...	...	...	...	110 0	
60 0	...	...	...	16 3	...	...	...	98 0	
65 0	...	...	15 9	14 4	...	...	...	95 0	
85 0	...	...	...	13 5	...	...	...	...	
98 0	...	...	...	14 8	...	...	...	...	In 1863 girthed 11 ft. 6 in. at 5 ft. 12 ft. 8 in. at 5 ft.
83 0	...	...	...	13 4	...	...	...	...	Near washing-green.
80 0	15 0	16 2	...	14 6	...	...	...	...	In 1863 girthed 11 ft. 1 in. at 5 ft. At Dovecot Polloc.
92 0	30 0	...	...	14 4	...	...	...	72 0	
85 0	35 0	...	...	13 2	...	...	...	55 0	
80 0	30 0	...	...	12 4	...	...	...	80 0	
103 0	25 0	22 3	...	14 10	...	...	...	...	
75 0	8 0	19 3	...	15 2	...	...	...	...	
90 0	20 0	21 0	...	12 1	...	...	...	...	
92 0	14 0	...	...	15 3	...	...	...	100 0	

## DESCRIPTION OF THE

County.	Place.	Altitude above Sea-Level.	Soil.	Subsoil.	Exposure of Site.
Ayrshire,	{ Kirkmichael,	Ft. in.			
"	{ Maybole,	...	Light sandy,	Gravel,	...
"	{ Eglinton Castle,	50 0	Light loam,	Clay,	...
"	{ Eglinton Gardens,	...	Damp,	Wet clay,	...
"	{ Irvine,	...	"	"	...
"	"	...	"	"	...
"	Sorn Castle,	400 0	Thin mossy soil,	Stiff clay,	...
"	"	"	"	"	...
"	"	380 0	"	"	...
"	"	"	"	"	...
"	"	"	"	"	...
"	"	350 0	"	"	...
"	"	"	"	"	...
"	"	"	"	"	...
"	"	380 0	"	"	...
"	"	"	"	"	...
"	"	"	"	"	...
"	"	420 0	"	"	} ...
"	"	"	"	"	"
"	"	"	"	"	"
"	"	430	"	"	} ...
"	"	"	"	"	"
"	"	"	"	"	"
Lanark,	Dalziel,	...	Loam (light),	Gravel and clay,	Open.
"	Lee,	...	Medium loam,	Sand and gravel,	W.
Midlothian,	Dolphinton,	834 0	Loam (light),	Clay and till,	...
"	Hopetoun,	120 0	Good loam,	Clay and gravel,	N.
"	"	"	"	}	...
"	"	"	"	"	"
"	Carlowrie,	92 0	Heavy loam,	"	W.
"	"	"	"	"	S. and W.
"	"	"	"	"	"
"	"	"	"	"	"
Midlothian,	Inghistoun,	110 0	Good loam,	Gravelly,	E.

## BEECH—continued.

Height of Tree.	Length of Bole.	Present Circumference of Trunk at			Any former recorded Measurements and Dates.			Diameter of Spread of Branches.	REMARKS.
		1 foot.	3 feet.	5 feet.	Date.	At 1 Foot.	At 3 Feet.		
Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.		Ft. in.	Ft. in.	Ft. in.	
89 0	20 0	...	...	12 2	...	...	...	...	
82 0	12 0	24 0	...	16 7	...	...	...	112 0	
80 0	6 0	13 0	...	11 9	...	...	...	...	Main branches very large.
76 0	8 0	13 4	...	12 0	...	...	...	...	Fine umbrageous head.
90 0	7 6	...	13	...	...	...	...	...	Numerous very heavy limbs.
66 0	6 0	11 0	...	9 5	...	...	...	60 0	
68 0	20 0	9 4	...	8 4	...	...	...	...	
70 0	10 0	10 8	...	9 1	...	...	...	...	
83 0	30 0	9 4	...	9 2	...	...	...	...	
70 0	20 0	13 0	...	10 0	...	...	...	...	
60 0	18 0	11 0	...	9 6	...	...	...	60 0	
63 0	20 0	10 9	...	7 10	...	...	...	65 0	
66 0	18 0	11 0	...	8 9	...	...	...	...	
70 0	20 0	12 0	...	9 7	...	...	...	...	
75 0	27 0	9 3	...	7 4	...	...	...	...	
...	...	...	...	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	Between high main gate and offices a row of 9 beeches with good clean boles, and girdling from 8 ft. 6 in. to 10 ft. 9 in. at 1 ft. from the ground, and from 6 ft. 9 in. to 9 ft. at 5 ft., with a height of about 75 ft.
...	...	...	...	...	...	...	...	...	The "Beech Walk" here is 370 yards long and contains 66 beech trees, whose lofty and umbrageous boughs form a fine canopy over a broad green ride on the north side, and on the south a gravel walk. These trees average from 10 ft. 10 in. to 8 ft. at 1 ft. from ground, and from 8 ft. 6 in. to 7 ft. 4 in. at 5 ft., and with clean boles of from 15 ft. to 25 ft. in length; they form a very interesting feature at Sorn Castle.
80 0	15 0	18 2 1/2	...	12 4	...	...	...	...	A very handsome tree.
85 0	16 0	18 4	15 4	14 9	...	...	...	...	A noble specimen.
70 0	20 0	...	...	10 7 1/2	...	...	...	...	A splendid beech avenue here called "The Dark Avenue," is highly pictur- esque, and contains many trees of large dimensions, girdling from 12 ft. to 17 ft. at 3 ft. from ground.
112 6	60 0	...	...	11 7	...	...	...	...	
...	...	...	...	...	...	...	...	...	
65 0	18 0	8 9	...	7 6	...	...	...	70 0	In 1864 was 7 ft. at 3 ft.
95 0	22 0	11 7	...	9 3	...	...	...	...	A very healthy specimen of copper-leaved variety.
85 0	17 0	11 0	...	8 10	...	...	...	...	A noble specimen.
80 0	16 0	10 11	...	8 7	...	...	...	...	
85 0	35 0	14 9	11 8	11 2	...	...	...	...	A very handsome tree, with long clean bole.

## DESCRIPTION OF THE

County.	Place.	Altitude above Sea-Level.	Soil.	Subsoil.	Exposure of Site.
		Ft. in.			
Midlothian,	Newbattle,	...	{Deep, light, sandy} loam, . . . }	Open gravelly, .	S.W.
"	Dalkeith Park,	150 0	"	"	...
"	"	"	"	"	...
"	"	"	"	"	...
"	Melville, Castle,	200 0	Sandy loam, .	Gravel, "	N.W.
"	"	"	"	"	N.W.
"	"	"	"	Sand and gravel, .	N.W.
"	"	"	"	"	N.W.
"	"	"	"	"	N.
"	"	"	"	"	N.
"	"	250 0	"	Gravel, "	S.W.
"	"	150 0	Clay loam, . .	Clay, . . .	...
"	"	...	"	"	Sheltered.
"	"	200 0	Sandy loam, .	Gravel, "	S.W.
"	"	150 0	Good loam, .	Loamy, . . .	Sheltered.
"	{Middleton, Gore- bridge, }	800 0	Light loam, .	Gravelly, . .	...
"	"	750 0	"	"	...
"	"	"	"	"	...
"	"	"	"	"	...
"	"	770 0	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
"	Woodhouselee,	730 0	Loam, . . .	Gravel and rock, .	S.E.
"	Cramond House,	30 0	Good loam, .	Gravelly, . .	S.
"	Craigiehall,	80 0	"	Clay and gravel, .	...
"	Calder House,	...	Light soil, .	Till and gravel, .	W.
"	Penicuik House,	...	Light loam, .	Gravelly, . .	W.
"	"	...	"	"	...
"	"	...	"	"	...
Peeblesshire,	Stobo,	721 0	"	Gravelly, . .	S.E.
"	Castlecraig,	750 0	"	Damp clayey, .	...
East Lothian,	Gilmerton,	120 0	Loam (poor),	Clay and stony, .	E.
"	"	"	"	"	E.
"	Tynninghame,	30 0	Good sandy loam,	Sand and clay, .	E.
"	"	"	"	"	...
"	"	"	"	"	...
"	"	"	"	"	...
"	"	"	"	"	...
"	"	"	"	"	...
"	Broxmouth Park, Whittinghame,	30 0 350 0	Sandy loam, . Red clay loam, .	Gravelly, . . Sandy and stone, .	E. N.

## BEECH—continued.

Height of Tree.	Length of Bole.	Present Circumference of Trunk at			Any former recorded Measurements and Dates.			Diameter of Spread of Branches.	REMARKS.
		1 foot.	3 feet.	5 feet.	Date.	At 1 Foot.	At 3 Feet.		
Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.		Ft. in.	Ft. in.	Ft. in.	
95 0	...	37 3	25 3	21 2	...	...	...	122 0	{ In 1863, girth at the base was 43 ft. and 18 ft. at 7 ft. from ground. In luxuriant vigour.
110 0	35 0	17 0	...	15 3	...	...	...	...	
108 0	28 0	16 9	...	15 1	...	...	...	...	
95 0	25 0	14 6	...	13 2	...	...	...	...	
75 0	13 6	14 0	...	10 11	...	...	...	...	
76 0	12 0	16 7	...	13 8	...	...	...	...	
78 0	15 0	17 2	...	11 4	...	...	...	...	
70 0	8 2	18 6	...	14 9	...	...	...	...	
60 0	13 6	10 0	...	8 8	...	...	...	...	
65 0	9 0	13 9	...	11 4	...	...	...	...	
70 0	8 6	17 0	...	10 11	...	...	...	...	{ A group of four beeches. A line stretched round the group measures 88 ft.
78 0	13 5	16 3	...	11 9	...	...	...	...	
75 0	15 6	14 6	...	9 11	...	...	...	...	
76 0	6 7	16 8	...	13 2	...	...	...	...	
83 0	10 8	23 5	...	16 11	...	...	...	...	
86 0	16 6	19 0	...	12 6	...	...	...	73 0	
64 6	14 0	14 0	...	10 5	...	...	...	80 0	
84 0	27 0	13 0	...	9 10	...	...	...	58 0	
72 0	22 0	13 0	...	10 9	...	...	...	76 0	
75 0	22 0	{ 9 3 11 0 9 10 11 3	{ ... ... ... ...	{ 8 0 9 0 8 5 8 11	{ ... ... ... ...	...	...	...	
80 0	9 0	13 6	...	11 6	...	...	...	...	{ There are many large beeches growing here, and girthing from 10 ft. to 15 ft. 6 in. at 5 ft. from ground.
76 0	10 0	12 2	...	9 11	...	...	...	...	
85 0	...	26 4	...	17 5	...	...	...	...	
...	...	...	...	...	...	...	...	...	
80 0	15 0	16 5	...	14 2	...	...	...	...	
75 0	35 0	14 1	...	12 6	...	...	...	...	
70 0	...	13 4	...	10 6	...	...	...	...	
73 0	...	15 6	...	12 6	...	...	...	...	
78 0	...	18 2	...	15 0	...	...	...	...	
75 0	10 0	18 0	...	15 0	...	...	...	80 0	
70 0	18 0	14 10	...	12 6	...	...	...	...	{ Divides at 10 ft. into two heavy limbs, which are tied together by an iron rod.
108 0	39 0	16 0	...	11 3	...	...	...	...	
87 0	27 0	13 6	...	10 4	...	...	...	...	
80 0	40 0	20 3	...	13 9	...	...	...	...	
80 0	38 0	19 5	...	12 10	...	...	...	...	
78 0	25 0	18 3	...	13 2	...	...	...	...	
80 0	30 0	17 8	...	12 3	...	...	...	...	
78 0	32 0	13 8	...	10 0	...	...	...	...	
70 0	24 0	13 8	...	9 6	...	...	...	...	
90 0	45 0	15 6	...	12 9	...	...	...	...	{ These appear the finest specimens of beech at Tynninghame, and there are thousands besides these, and about same dimensions. The beech avenues here, and the rides in Binning Wood are very fine examples of formal style of planting, so general during the early part of last century.
70 0	30 0	11 5	...	9 8	...	...	...	...	

## DESCRIPTION OF THE

County.	Place.	Altitude above Sea-Level.	Soil.	Subsoil.	Exposure of Site.
		Ft. in.			
East-Lothian,	Belton,	75 0	Loam, . . .	Freestone, . . .	N.
"	"	"	"	"	N.
"	"	"	"	"	E.
"	Yester,	400 0	Clay loam, .	Red sandstone, .	W.
"	"	350 0	"	Gravel, .	Sheltered,
"	"	"	"	"	Sheltered,
"	"	"	"	"	Sheltered,
"	"	"	"	"	Sheltered,
"	"	"	"	"	Sheltered,
"	"	500 0	"	"	Sheltered,
"	Pressmennan,	700 0	Strong loam, .	Gravel and rock,	E.
"	"	"	"	"	E.
"	"	"	"	"	E.
"	Biel,	120 0	Sandy loam, .	Gravel and clay, .	E.
"	"	"	"	"	E.
"	"	"	"	"	E.
"	"	"	"	"	E.
Berwickshire,	Dunglass,	200 0	"	{White freestone rock, . . .}	N.E.
"	"	"	"	"	N.E.
"	"	"	"	"	N.E.
"	"	"	"	"	N.E.
"	"	"	"	"	N.E.
"	"	210 0	"	"	W.
"	"	150 0	"	"	N.E.
"	Miln-Graden,	100 0	Light loam, .	Boulder clay.	...
"	Thirlstane Castle,	...	Clayey loam,	Tilly, . . .	E.
"	"	...	"	"	E.
"	Marchmont,	500 0	Strong red clay, .	Hard red till, .	S.
"	"	"	"	"	S.
"	Kimmerghame,	...	Red loam, .	Sandy, . . .	W.
Roxburghshire.	Floors Castle,	...	Strong loam, .	Blue clay, . .	S.
"	"	...	"	"	S.
"	Cavers	...	Good loam, .	Clayey, . . .	S.
Dumfries,	Drumlanrig,	280 0	Rich friable loam,	Gravel, . . .	...
"	"	290 0	"	"	...

BEECH—*continued.*

Height of Tree.	Length of Bole.	Present Circumference of Trunk at			Any former recorded Measurements and Dates.			Diameter of Spread of Branches.	REMARKS.
		1 foot.	3 feet.	5 feet.	Date.	At 1 Foot.	At 3 Feet.		
Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.		Ft. in.	Ft. in.	Ft. in.	
63 0	31 0	32 3	...	20 4	...	...	...	...	{ A very magnificent specimen. A large hollow on the west side of its trunk is rapidly closing by the growth of healthy bark; and a stone trough, which had in its earlier years stood at its side, is now quite embedded in the tree by its root columns and buttresses growing quite over it. Only a very small portion is visible.
65 0	43 0	13 0	...	10 2	...	...	...	...	
70 0	25 0	9 10	...	9 0	...	...	...	...	
70 0	19 0	27 0	...	17 6	...	...	...	...	{ In Anna Park. Very handsome tree.
70 0	23 0	17 0	...	11 0	...	...	...	...	
80 0	22 0	25 10	...	16 9	...	...	...	...	
75 0	24 0	22 0	...	15 1	...	...	...	...	{ In Carter's Haugh. Very luxuriant.
70 0	22 0	20 0	...	13 10	...	...	...	...	
75 0	9 0	19 6	...	14 8	...	...	...	...	
70 0	11 6	23 6	...	16 2	...	...	...	...	{ Goes into two huge limbs at 11 ft. 6 in. Grows in "Kale-rig."
80 0	40 0	13 10	...	11 5	...	...	...	80 0	
107 0	14 0	15 9	...	11 6	...	...	...	70 0	{ Divides into two very large and two smaller limbs at 14 ft. from ground.
102 0	42 0	13 8	...	9 5	...	...	...	60 0	{ Many others of similar dimensions in same wood.
105 0	38 0	11 10	...	11 8	...	...	...	...	{ In Burnbank Wood.
60 0	12 0	9 0	...	8 0	...	...	...	...	{ Fine round head. Purple-leaved variety.
96 0	25 0	15 2	...	13 8	...	...	...	...	
100 0	50 0	13 2	...	10 10	...	...	...	...	
80 0	30 0	13 6	...	11 3	...	...	...	...	{ Growing in the Dene.
84 0	35 0	13 9	...	11 9	...	...	...	...	{ A magnificent tree, girths 10 ft. 11 in. at 14 ft. from base.
98 0	60 0	11 2	...	10 8	...	...	...	...	
110 0	40 0	12 4	...	11 1	...	...	...	...	
102 0	62 0	12 0	...	10 1	...	...	...	...	
120 0	52 0	14 7	...	12 6	...	...	...	...	{ At west side of house. A very fine specimen.
120 0	42 0	16 11	...	12 9	...	...	...	...	{ In Bilsdean Wood. Remarkably fine and handsome tree.
122 0	...	15 9	...	13 7	...	...	...	...	{ A very handsome tree.
60 0	25 0	17 5	...	16 9	...	...	...	...	
65 0	30 0	13 7	...	12 8	...	...	...	...	
98 0	31 0	18 4	...	13 4	...	...	...	...	
75 0	20 0	16 2	...	11 4	...	...	...	...	
85 0	28 0	15 10½	13 10	13 6	...	...	...	...	{ Many more similar tall and fine beeches grow here.
70 0	40 0	15 2	...	12 9	...	...	...	...	
80 0	50 0	16 3	...	14 3	...	...	...	...	{ Many similar, girthing on an average 15 ft. at 1 ft.
53 0	20 0	17 2	...	12 3	...	...	...	...	
90 0	15 0	22 6	...	15 0	...	...	...	98 0	{ On west side of road from "Doo-cot Knowe."
88 0	13 6	21 3	...	14 4	...	...	...	106 0	{ East side of flower garden.



## DESCRIPTION OF THE

County.	Place.	Altitude above Sea-Level.	Soil.	Subsoil.	Exposure of Site.
Dumfries,	Eccles,	430 0	...	...	S.E.
"	Closeburn,	...	Light loam,	Gravelly, . .	...
"	Raehills,	...	Gravelly soil, .	Whinstone rock, .	N.W.
"	"	...	"	"	N.W.
"	"	...	"	"	N.W.
Kirkcudbright,	{ Kirkconnell (Newabbey), Kennure (New Galloway), }	...	Light loam, . .	Gravel and clay, .	...
"	"	100 0	"	Gravelly, . .	S.E.
"	"	"	"	"	S.E.
"	"	"	"	"	S.E.
Wigtownshire,	...	...	...	...	...
Bute;	Mountstuart,	90 0	Gravelly. . .	Brown gravel, .	E.

BEECH—*continued.*

Height of Tree.	Length of Bole.	Present Circumference of Trunk at			Any former recorded Measurements and Dates.			Diameter of Spread of Branches.	REMARKS.
		1 foot.	3 feet.	5 feet.	Date.	At 1 Foot.	At 3 Feet.		
Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.		Ft. in.	Ft. in.	Ft. in.	
65 0	...	...	...	20 3	...	...	...	...	{ In 1863 girth at 2 ft. from ground 26 ft.; at 4 ft. it was 20 ft. at 7 ft. 25 ft., and at 16 ft. it was 17 ft., and spread of branches was 300 ft. in circumference.
80 0	12 0	17 8	15 4	...	...	...	...	...	{ Girth at 12 ft. from ground is 15 ft. where it branches into 4 large stems.
50 0	...	13 6	...	11 10	...	...	...	59 0	
60 0	...	12 3	...	10 4	...	...	...	...	
54 0	...	11 2	...	9 9	...	...	...	71 0	
60 0	...	19 4	...	16 4	...	...	...	80 0	
80 0	...	22 0	...	14 4	}	...	...	...	{ There is here a row of nine, similar in dimensions to these given.
84 0	...	19 10	...	13 4					
75 0	...	19 8	...	15 4					
...	...	...	...	...	...	...	...	...	{ Many fine specimens of considerable size abound in this county. They girth from 10 ft. to 17 ft. at 3 ft. above ground.
73 6	21 0	...	...	13 6½	...	...	...	...	{ Girthed 13 ft. in 1870. Very vigorous. There are several other beeches of similar dimensions in Bute, and a magnificent "Beech Walk" at Mountstuart, 570 yards in length.

ON THE OLD AND REMARKABLE OAKS (*Quercus*  
*Pedunculata et Sessiliflora*), IN SCOTLAND.

By ROBERT HUTCHISON of Carlowrie.

[Premium.—*The Gold Medal*.]

ALTHOUGH these two well-known varieties of the British oak (*Quercus Robur*) are sufficiently distinct botanically to be classed as separate species in a report like the present upon the large and old oaks in the various districts of Scotland, it is necessary to treat them indiscriminately, and, indeed, as it is not so much the intention of this chapter of the old and historically remarkable trees, to present any scientific or botanical description, or narrative of their physiology or morphology, as to lay before the reader as accurate and full a catalogue as possible of the many majestic specimens of this monarch of the woods abounding in its native habitat, it is probably quite pardonable to treat these two varieties together without distinction, especially as it has been found extremely difficult to obtain sufficiently reliable difference in each from the mass of returns furnished by careful correspondents, whose kindness and trouble in correctly furnishing minute data of dimensions and other details, it would be quite unfair to tax by asking further information as regards a purely systematic botanical distinction. Both varieties are found growing together in Scotland in their natural condition, and both are indiscriminately employed for commercial purposes when converted as timber of home growth. Of the two it may be safely asserted that *Q. pedunculata* is by far most generally met with, and the details in the appendix to this chapter on oaks are mainly occupied with examples of this variety. *Quercus sessiliflora* is much more commonly met with in England than in Scotland, and there are some immense trees of it in that country, but principally in the southern counties, as, for example, in many parts of Kent, Sussex, and Devonshire; and on the authority of Mr Bree, *Q. sessiliflora* is the almost exclusive representative of the *Quercus* family in the lake districts of England, in Westmoreland and Cumberland.

All former writers on arboricultural topics agree in allotting the foremost rank, both in point of dignity, grandeur, and utility, to the oak. Its beauty of outline when fully developed, combined with its strength, and unyielding resistance to the effects of the blast in exposed sites, are its chief characteristics of habit during life; and when manufactured into timber, the wide and almost universal purposes to which it may be profitably and suitably applied, are as characteristic of it as are those of it during life which we have referred to. "It is a remarkable

circumstance," as has been well observed by Sir Henry Stewart, "that the most ornamental tree in nature, should also be the one the most extensively and strikingly useful."

It is thus seen that although Britain can only lay claim to two species of the great genus *Quercus* as truly indigenous to her soil, while the rest of the family, amounting (taking evergreen as well as deciduous) to upwards of one hundred and fifty distinct botanical species, are all of exotic origin, and are distributed in both hemispheres of the globe, either in temperate zones, rendered so by their latitudinal position, or in tropical climates by their elevation,—yet these two are by far the most important, for they surpass all others not only in majesty of proportions and duration of life, but also in general utility, durability and strength of their timber, so that for all uses to which these properties are absolutely essential, the two varieties (or rather species) of the oak now under notice, if equalled, are at all events not surpassed by any other tree indigenous to Europe.

The oak being thus one of the few indigenous hard-wooded trees in Britain, it appears, from ancient records and references in old parchment deeds, to have had a very wide distribution generally throughout the country. Indeed, before the clearing away of the old forests had commenced in early historical times, it appears to have been the chief, if not the only, component of these early forests, and to have covered a very large area of the surface of Scotland. Sufficient living remnants of these ancient forests still exist, and to which reference will afterwards be made to show the wide area of the distribution in Scotland of the oak, while in other districts, where these natural or self-sown forests have disappeared, or are now only rarely marked by a few straggling survivors, the remains of noble and massive trunks of oak trees are frequently stumbled upon, embedded sometimes in the alluvial deposits along the banks of rivers, or in bogs, submerged under deep layers of peat moss, the growth and accumulated debris of centuries. In this manner, also, many oaks are found where now no living specimens are to be seen within even a wide range of the spot, and also where now no oak plantations are to be met with; especially near sea-water mark, stumps of large and old trees, composing aboriginal forests now untraceable, are sometimes found *in situ* standing erect, but quite concealed excepting at very low tide ebb, near river mouths and along some of our coast line. For instance, at Kirkconnell, Newabbey, Kirkcudbrightshire, some years ago, Mr Maxwell Witham,—to whose courtesy we are indebted for interesting information regarding many trees of other varieties in his neighbourhood,—recovered from the sands opposite his property an "*antidiluvian*" oak tree, broken at both ends and measuring 36 feet in length

and 14 feet 8 inches in circumference at the middle of the trunk, thus giving 484 cubic feet of timber. He further informs us that the whole valley of the Nith at its lower end (about Kirkconnell and Newabbey on the borders of the Nith, and Newabbey Poer or stream) is thickly underlaid, at a depth of from 4 to 7 feet, with large oaks, which are frequently exposed, and brought to light by the shifting of the river Nith or its tributary streams. In this locality some large and fine oaks still exist at the present day, and by reference to the appended returns to this paper, it will be seen that they girth from 14 feet 9 inches to 20 feet in circumference at 1 foot, and from 13 feet 9 inches to 17 feet 6 inches at 5 feet above ground. Other submerged forests—if they may be so called—of oaks exist on other parts of the coasts of Scotland; while in the Highlands, and the more remote northern counties, as well as in several of the adjacent islands of the Hebrides, oak trunks are fallen upon in cutting peats where now not a tree is to be seen. Were these districts, and the Scottish islands generally, therefore, always incapable of growing timber, as they are too generally supposed and believed to be at the present day? The evidence goes to prove that they were not, and strong grounds for hope may be consequently entertained that, with perseverance and the introduction of the suitable descriptions of trees, these wastes may be again, through the energy of their proprietors, replanted with success. Of course, it must not be imagined that we advocate the planting, in sea-board situations, of the oak, for although these remains of former oak forests, of which no history save their gaunt stumps and fallen trunks now remain, are found under sands, and even below the tide-mark in various localities, this may be owing to the variations and upheavals of the beach, to inroads by the sea upon the land, and to various causes of a similar nature having altered the relative position of sea and land at the present day, from what these occupied when these now submerged woodlands waved their foliage and reared their gigantic trunks in pristine health and vigour. We find similar traces of early indigenous oak plantations in Scotland having existed in very remote times in far inland situations and even at considerable altitudes. For example, at Dunkeld, in Lady Well Wood of the Athole plantations, and upon a flat plateau in the upper part of the wood, at considerable altitude, there is a curious formation of the ground,—abrupt heights or knolls being interspersed with basin-like hollows,—where, some years ago, in the course of draining these hollows, the workmen came upon the remains of the trunks of many old indigenous oaks embedded in the soil. They were of great size, and lay strewed in one direction, as if at some remote period the whole had succumbed at one time to some sweeping hurricane which had lashed across the district, levelling whole

tracts of wood before it, the soft nature and dampness of the site in these hollows making the trees there a more easy prey to its violence than in drier and firmer soils. Where these remains interfered with the draining operations they were cut across and allowed to lie. The wood was still hard and sound and of a black colour.

Of old and remarkable oaks in Scotland noticed and recorded by earlier writers, several still exist, and have been identified, and their present dimensions taken, for the purpose of this report, and these will be found in the tabulated returns annexed. A few of these early recorded trees may be here referred to, before passing on to consider in detail many remarkably fine specimens of this noble tree, not hitherto or only imperfectly noticed by former writers.

The old oak standing north from the Castle at Lochwood in Annandale, recorded by Dr Walker as measuring, on 29th April 1773, at 6 feet above ground, 14 feet in circumference, and as being then about 60 feet high, with a fine spreading head exactly circular, and covering a space of about 60 feet diameter, still exists, though evincing symptoms of extreme old age. Measured at the same point in 1873, it was found to be 16 feet, having only grown 2 feet in a century. Measured carefully in October 1879 it was then 19 feet 8 inches at 1 foot;—18 feet 10 inches at 5 feet above ground, and its bole was 12 feet 10 inches in length. In Dr Walker's time this tree was supposed, but upon what authority is not stated, to have been about 230 years old. Walker cursorily notices another oak, inferior, he says, to the first mentioned, growing near it, but in 1773 "measuring near 15 feet in girth." In 1873 it measured at same point 17 feet, and at 2 feet above ground it was 19 feet. Of this tree he gives no further details; but we find in 1879 that it girthed 24 feet at 1 foot, and 20 feet at 5 feet above ground, and had a bole of 19 feet 2 inches in length. These trees are still growing in comparative vigour; they are planted in a good dry woodland soil at a high altitude, being not less than 900 feet above sea-level.

The oak at Barjarg in Nithsdale, measured on 15th July 1796, was 17 feet in circumference close by the ground. At a height of 16 feet it measured 11 feet 11 inches, at 32 feet it was 11 feet 7 inches, and at 46 feet from the ground it was 6 feet 8 inches in girth. Dr Walker further states that this tree on 13th July 1773 measured 16 feet at the ground, and at 16 feet high it was then 10 feet 3 inches. It had therefore increased 1 foot in bulk at the base and 1 foot 8 inches at 16 feet from the ground in these twenty-three years. More recent records of this oak, undoubtedly the finest in Dumfriesshire even in its decaying state at the present day, may prove interesting, as showing its waning progress with the flight of time. In 1810 it was 17 feet

2 inches in girth at  $4\frac{1}{2}$  feet from the ground, and in 1879 it measured 19 feet 3 inches above the conoidal base and 16 feet 3 inches at 6 feet above the ground. The bole is straight in its timber to the height of 50 feet, and the spread of the branches covers an area 60 feet in diameter. We have also ascertained that this tree was measured by a carpenter in 1776, and was found then to contain 250 cubic feet of timber in its stem. In the year 1762, the Lord Barjarg of that period was informed by some very old residents on the estate, that about 90 years previously (1670) it had been "bored" with the design of cutting it down, if the wood in the core had been sound. From the hole bored some branches sprouted, one of which was then (1762) of considerable diminutions. From this it may be inferred that it had then begun to wane; but it is another instance of very old trees, which from some circumstance or another, after showing considerable symptoms of decline, such as hollowness in the stump or in the branch clefts, again putting on new vigour, and covering over nature's incipient decay with rejuvenescence and new life. This oak appears to have long enjoyed celebrity. It was called the Blind Oak of Keir,\* and is said to be mentioned by that epithet in some ancient title-deeds pertaining to the district, written under the shadow of its umbrageous boughs at least two centuries previous to 1810. It has made two narrow escapes from being lost to its native county, of which we trust it may long continue to be the boast, for besides being tested for soundness with a view to sale as above stated in 1762, its proprietor was, about the beginning of the present century, offered £30 for it as it then stood!

Other notable oaks in this district will be referred to subsequently in this report, when we come to describe specimens not hitherto recorded by previous writers.

An oak growing on the roadside between Inversanda and Strontian in Argyllshire was measured on 27th October 1764, and was then at 1 foot from the ground 17 feet 3 inches; at 4 feet it measured 16 feet 3 inches; and at 15 feet, where the bole divided into branches, it was 13 feet in girth. It is stated by Dr Walker to have been then in a decaying condition, and from a careful investigation made in the district recently, no trace of it has been found, nor can any one be found who can tell the tale of its fall and removal or subsequent history. Walker mentions the fact that the remains of many other great oaks, approaching to the same size, were observed by him in this vale of Morven, and were all situated among rank heather, in deep peat earth, lying above banks of mountain gravel. This tree was probably, therefore, the last survivor of one of Scotland's indigenous oak forests of very early times in that district.

\* Keir is the name of the parish in which it is situated.

Another of the early Scottish recorded oaks growing on the island of Inchmerin in Loch Lomond, has either so altered by its decay as to be now unrecognisable, or has disappeared entirely. An examination of the island last year failed to lead to the identification of "Jack Merin," as this oak was called, although several very interesting and hoary veterans were found, and are now recorded in the appended returns. "Jack Merin" stood near the middle of the island towards the east side, and measured, on 22d September 1784, 18 feet 1 inch. It was then "fresh and vigorous, and remarkable for its fine expanded head, without any appearance as yet of the stag horns." The only oak tree now corresponding with the position in the island ascribed to Jack, is a most magnificent specimen of a short-stemmed spreading tree. Measured on 15th August 1878, the indefatigable forester who explored the island to endeavour to identify and measure Jack's dimensions at that date, reports this tree to be 22 feet 6 inches in girth at 2 feet from the ground, and divides into several heavy limbs at 4 feet from the ground. He estimated that the bark of this tree alone would weigh about 3 tons, and that he had nowhere seen such a weight of oak timber growing from a single trunk. This description is not quite incompatible with the meagre account handed down to us of "Jack Merin," with whose site it corresponds, and although Walker states the soil in 1784 to be "a moorish, weeping soil," this also may hardly be considered as differing essentially from the soil as stated in 1878, when it was described as being "deep, humid soil." At all events, if this tree be not the veritable "Jack Merin" of 1784, it occupies as nearly as possible the same site, so that if Jack has since "gone aloft," to use the words of Mr Gordon, who measured this and the other Loch Lomond oaks in 1878, this veteran must have been his contemporary and neighbour, and as such deserves notice, as being now, perhaps, the only living witness of his "ascent"! The next oak in point of size on the island, in 1784 measured 11 feet 2 inches in girth. Such is all the description handed down to us. Of course, from such meagre evidence it is now impossible to identify this tree at the present day; but we may give the particulars here of the only other very venerable and hoary relic of an evidently far distant century growing near the northern shores of the island. At 4 feet above ground it girthed, in August 1878, 17 feet 6 inches, and at 7 feet the bole divides into three huge limbs, the two largest of which measure respectively 12 feet, and 6 feet 9 inches in girth. A branch springing from the largest limb measures 9 feet in girth, and the diameter of the spread of branches is 111 feet. "Several branches of large dimensions appear to have been wrenched off at various times in its history, while its lean foliage and numerous old unrecuperated



saw draughts tell of its vigour having been spent." Other large and old oaks still thriving on this island will be found on reference to the appended returns.

As we have already seen in considering the old sycamores in Scotland, that many fine specimens are either ascribed to the planting by the hand of the unfortunate Mary Queen of Scots, or as commemorating eventful incidents in her history; so in like manner, we find that the oak has also its appropriate patron, many trees in different parts of the country being called "Wallace's Oaks," and associated in tradition with incidents in the life and chequered career of Scotland's great liberator. Sir William Wallace's oak in Torwood near Stirling, has been in the annals of Scotland immemorially held in veneration. In this ancient Torwood, it stood in a manner alone, there being no trees, nor even the ruined remains of any tree to be seen near it, or that could be said to be coeval with it. The tradition of its having afforded shelter and security to Wallace when he had lost a battle, and was escaping the pursuit of his enemies, probably served to secure its preservation, when the rest of the wood at different periods had been destroyed. In 1771 it had fallen into a state of advanced decay, having at some previous date separated down the middle, and one half having entirely mouldered away. The other half, however, remained, and was then at one point about 20 feet in height; what the tree ever was above this is lost in obscurity. From the peculiar mode of renovation of old trees already referred to, a young bark had shot upwards from the root in several places, which had thrown out fresh shoots developing into branches, towards the upper part of the old shell of the trunk. This healthy young bark spread like a callus over several dead parts of the old trunk and over an old arm. It measured then, so far as the girth of the tree could be estimated from the size of the half that remained, about 22 feet. It had never been tall, having forked into several large limbs about 10 feet from the ground, thus affording at the division a very likely and convenient place of concealment for a fugitive. From information kindly furnished by the Rev. J. McLaren of Larbert, we further learn regarding this historical and interesting tree. He writes as follows:—"The real Wallace oak is gone for ever. It stood in what was a part of the Torwood some centuries ago, but the knoll which it occupied has been long separated from what is now called the Torwood by ground which has been cleared, and is quarter of a mile from the present wood. The old forester (ætat 72), who has lived nearly all his days in the Torwood, cannot remember ever having seen the veritable tree; but Mrs Stirling of Glenbervie, who is also of a similar age, remembers well having accompanied her late husband and a young Oxonian, who was filled with zeal about Wallace, to see

the oak, on a bright day in May 1835, and that then the old tree stump had sent forth a young shoot. Since then the copse has been rampant, and quite obliterated the old tree. The knoll is still called 'Wallace's Wood;' a small plantation it is, and a field adjoining it, 'Wallace's Bank,' and another field near by is 'Wallace's Kail-yard.' There is, however, an innocent imposter, which the people about insist on calling Wallace's oak. It stands within the policies of Carbrook, close to Torwood, and is evidently some two or three hundred years old. But though a respectable tree, it is far too young to have been connected with Wallace." Near the latter tree is an old thorn, which is called "Cargill's Thorn," from the circumstance that that renowned Covenanter is said to have stood under its branching head, when he excommunicated Charles II.

About a mile south-east, close to Glenbervie House, stands a small but evidently very old oak tree, about 7 to 8 feet in girth, called the "Jowg Tree," from the fact that a pair of "jowgs" were in olden times fastened to it for the temporary exposure of delinquents. There is a tree bearing a similar name at Ochtertyre in Perthshire, and the appellation is not uncommon in other places.

Another famous "Wallace Oak" grew near the village of Elderslie, Renfrewshire. In 1825 the trunk of this oak measured 21 feet in circumference at the base, and 13 feet 2 inches at 5 feet from the ground. It was then 67 feet high, and the branches covered altogether an area of 495 square yards. In 1854 this sylvan giant and land-mark of the past had become the merest wreck of what it was even a few years previously. Time and the storms of centuries had done their work, but worse than all, the relic hunters had been unceasingly nibbling at this once majestic trunk. Little more than a blackened torso then, this oak remained, with only a few straggling shoots showing any symptoms of vitality. The dreadful storm of February 1856, completed the destruction, for by it this grim old sylvan veteran, with thousands of his less remarkable compeers, was levelled with the dust. Hundreds of relic hunters in the district, hearing of Wallace's overthrow, hurried to the spot, and soon accomplished with bowie knife and gully a thorough dissection of the prostrate hero. Mr Spiers of Elderslie, however, hastened to the rescue, and had the mangled and mutilated remains of the trunk conveyed and safely lodged in his residence at Renfrew, where they have since found a fitting resting-place. Several articles of furniture have since been converted out of portions of this tree by the proprietor of Elderslie and Houston, and when a few years ago the foundation stone of Houston parish church was laid, the mallet used on the occasion was made from a piece of Wallace's Oak. Two vigorous and thriving

oaks in front of Houston mansion-house were reared from acorns of this famous tree, and so eager were the inhabitants of the district to secure some mementos of Scotland's liberator, that some of them even collected the sawdust in bottles for preservation when the stump was cut up! The tradition lending interest to this historical tree is, that Wallace and several followers on one occasion, when hotly pursued by the vindictive Southerns, found welcome shelter and safety among its umbrageous foliage.

The largest oak tree of which we have any record in Scotland grew in the very old oak wood on the north side of Loch Arkeg in Lochaber, where we learn from Walker, that in 1784 there were many trees from 10 to 14 feet in girth at 4 feet from the ground. This one, however, measured at 4 feet above ground in that year, 24 feet 6 inches. He does not state the condition in which the tree then was, but all trace of it has now disappeared.

From these records it will be observed that even the largest oaks of which any record has come down to us in Scotland, probably from the difference of soil and climate, are greatly inferior in dimensions to the large oaks in Southern Britain; for such well-known trees as the Wetherby Oak, which Mr Beevor informs us measured at 4 feet from the ground 40 feet 6 inches,—while there are others in England which are said to have been still larger,—quite eclipses those found in our more northern climate. Nor do any of the remains of indigenous oak forests, found either submerged or embedded in peat in Scotland, lead to the supposition that their denizens had attained to greater sizes than those we have mentioned. In Inverness-shire, at the head of Loch Garry, Sir T. Dick Lauder found the remains of a prostrate oak forest upon the surface of the solid ground, among which he found one tree with a clean stem, 23 feet in length and 16 feet in circumference at the butt end and 11 feet towards the smaller end under the fork. The stock whereon this oak had grown and close to which it lay, was quite worn away in the centre, and so hollowed out as to encircle a large and thriving self-sown birch tree of more than 3 feet in girth.

Of other oaks still existing in Scotland, and remarkable for age and size, but probably little, if in some instances at all noticed, we find notable examples in a few remaining trees of the Jed Forest, in Roxburghshire, where there is still to be seen "The Capon Tree." It is a short-stemmed but very wide-spreading oak, with a circumference at the base of 24 feet 3 inches. The legend attached to it is, that it formed the trysting-place for the muster of the border clans in bygone times; although probably, from its name "Capon"—and of which there are other trees similarly styled in different parts of Scotland,—it served another purpose also, having pro-

bably been the selected spot, and under the shade of whose umbrageous head, the early border chieftain attended to receive the rents or tithes of his vassals, many of the lands being held of their superior by an annual payment of fowls, cattle, corn, &c., and frequently we find the reddendo of a "capon" was a common act of fealty. Not far from the capon tree stands another oak, probably also a relic of the ancient Forest of Jed. It is called the King of the Woods, and is a beautiful and vigorous tree, with a trunk 43 feet in height, and a circumference of upwards of 17 feet at 4 feet above ground. Other interesting old oaks are still found in the remains of the Caledonian Forest in the park of Dalkeith, in Cadzow Forest, at Lochwood in Dumfriesshire, and in single trees in many parts of Scotland. These are given in considerable detail in the appended returns to this paper, and reference will accordingly now only be briefly made to some of these of most interest.

The returns contain no examples of oak from Aberdeenshire, where its presence seems to be somewhat rarer than that of other descriptions. At Keithhall in that county, although planted in the most suitable soils and sites, the oak does not appear to thrive. The soil, too, is a deep loam, which is generally favourable to oaks, and in the higher parts of the estate it is a light black soil on a stiff clay or "pan." In Morayshire, along the banks of the Findhorn, there are a great number of fine oaks, one of the specimens given in the schedule girths at 1 foot from the ground 27 feet 9 inches, and has evidently sprung from an old oak stool, for it divides into seven limbs, which, growing together for about 3 feet from the base, divide, and form as it were seven separate trees, each limb being the size of a good useful tree. At Brodie Castle, Morayshire, there are some very good oaks, growing in a sandy loam soil upon a subsoil tending to clay. One given in our returns is a very massive tree, girthing 16 feet at 1 foot, and 12 feet 11 inches at 5 feet from the base. It carries a good girth well up its bole, which is 35 feet in length. This and the other oaks returned from Brodie Park were planted between the years 1650 and 1680. On the estate of Gray, Forfarshire, there is a noble oak tree, supposed to be about two hundred and fifty years old, and girthing 26 feet 2 inches and 17 feet 2 inches at 1 and 5 feet respectively, growing in a black deep clayey loam upon a sandy and gravelly subsoil, and containing by the forester's measurement 623 cubic feet of good measureable timber. Upon Lord Mansfield's estate of Innernytie in Perthshire, in the Craigbank Oak Wood, in a secluded dell on the brink of the river Tay, stands a venerable aged oak, which has hitherto escaped the notice of the arboriculturist, and judging from its ancient appearance, there seems no reason to doubt that it has weathered the blasts and tempests of at least five hundred

winters. At 5 feet above ground it measures 20 feet 10 inches in girth, and is still growing vigorously, and making wood annually. Many other magnificent oaks throw a mantle of hoary and honoured antiquity around the woods and policies of the royal palace of Scone. Near the two-mile stone from Perth, near Balboughty plantation, stand three fine specimens, which are remarkably large for their age. The first two (see returns) are *Quercus sessiliflora*, and the other *Q. pedunculata*. The first were planted in 1808, and the other a year later. Measured in August 1878, the first has a fine bole of 56 feet in length, and is 80 feet high. It girths 5 feet 7 inches at 5 feet above ground, and contains 76 cubic feet of timber. The second is about the same height, is 7 feet in girth at 5 feet, and has  $93\frac{1}{2}$  cubic feet of timber. The third (*Q. pedunculata*) has a clear bole of 57 feet, girthing 6 feet 11 inches, and contains 114 cubic feet of timber. In the policies at Scone, near the river Tay, and in a hollow, stands a majestic wide-spreading oak, planted by King James VI. of Scotland and I. of England. The diameter of the spread of its branches covers 75 feet. It is now 55 feet in height, 15 feet 3 inches at the base, 14 feet 2 inches at 3 feet, and 13 feet 4 inches at 5 feet from the ground. Not far distant stands a sycamore, also planted by the same monarch, and girthing 12 feet 3 inches at 4 feet from the base. North of the old Scone burying-ground, in which are some stones of the early part of the fifteenth century, including that of Alexander Mar, sixteenth Abbot of Scone, who flourished when the battle of Flodden was fought, is an oak of great symmetry and vigour, planted in 1809. It is now 70 feet in height, with 40 feet of straight clear stem, and is at the root 10 feet 4 inches in girth, and 8 feet 4 inches at 5 feet. Although at Castle Menzies the soil is light, and resting on pure gravel or sand, at no great depth, there are some fine oaks. In our returns, two specimens are described which grow there. The first is near the pond, and is a noble tree, girthing 15 feet 6 inches at a foot, and 12 feet at 5 feet from the ground. This tree is 70 feet in height, and but from the fact that it has had one large limb near the top broken off some years ago, would have been much taller at the present day. This untoward accident befel it in 1858, which was in the district a very late and backward season, snow falling heavily before the leaves had been shed. The superincumbent weight of snow on the topmost branches and foliage broke off many branches about Castle Menzies policies, and sadly disfigured some of the fine trees there. At the east gate of the park of Castle Menzies stands a remarkable oak (see returns). The peculiarity of this tree is, that it presents on one of its large limbs, about 25 feet from the ground, a curious branch about 6 feet long, with *pure white* foliage, densely matted and quite distinct from all surrounding and adjacent branches. The white

variegation, though completely local, is very persistent, and has continued now for years. The interest in this odd freak of nature is further increased by the presence (gradually disappearing) of an old bell, which, in former times, was suspended between two of the limbs, but which is being stealthily and quietly overgrown, and embedded in the development of the limbs, and must ere long be entombed in its living sepulchre! But in no part of the tree-growing and tree-loving county of Perth are better examples to be found of the oak as well as of other hard-wooded trees than at the Athole woods surrounding Dunkeld. Although the ancient forest of Birnam Wood has never quite recovered the famous march of its ancestors to Dunsinane, many thriving plantations are rapidly clothing the hillsides, while still a few remnants of the old aboriginal trees, and others planted fully two centuries ago, remain to testify to the magnificent proportions of those early plantations, which in the course of time and nature have gradually given way to younger followers. Near the river Tay at Birnam, and behind the hotel, may still be seen two immense trees, an oak and sycamore, popularly credited as being the sole remnants of that celebrated forest. Both are in full foliage and green vigour at the present day, and likely to live for many years to come. The sycamore having been already noticed in the foregoing chapter on that tree, we now briefly refer to the oak. It is 19 feet 7 inches in girth at 5 feet from the ground, and grows in a good deep alluvial loamy soil, on gravel subsoil, quite close to the river Tay. Other remains of decayed oak root stumps have been frequently found in the vicinity, no doubt relics of that great primeval forest which so disturbed the peace of Macbeth. Within the Dunkeld policies are many large and interesting examples of oak trees, and of these we are able, from personal observation, to give a few records. In the "King's Park" in the policies at Dunkeld, an oak flourishes near the river side which girths at its narrowest point, 4 feet from the ground, 15 feet 2½ inches, and at 3 feet from the ground, it is 15 feet 8½ inches in circumference. It has a fine bole of 12 feet, and then branches into five huge limbs, each of them being the size of any ordinary tree. Its spread of branches measures 99 feet in diameter. On the opposite bank of the Tay from the point where this oak grows, is seen the famous oak under whose kindly shade the celebrated Neil Gow was in the habit of retiring with his violin, and where tradition reports he composed some of his finest pieces. This tree is pointed out as "Neil Gow's Oak."

"Famous Neil,  
The man that played the fiddle weel."

This celebrated fiddler died in 1808, in the romantic little hamlet of Inver, not far westward from the site of the oak now

identified with his name and fame in song. Another magnificent specimen of the *Quercus pedunculata* at Dunkeld is given in our returns, and is very characteristic of the growth and habit of this variety under favourable auspices. Another picturesque oak at Dunkeld stands on the terraced bank on the opposite side of the Tay to "Neil Gow's Oak," and in full view of that tree. It is called the "Duke and Duchess Oak." It is a huge massive stump, 16 feet in girth, dividing into two large limbs quite near the ground, the cleft being fitted up as a seat. It is evidently a fresh growth from one of the aboriginal oaks of the district. The grounds of Moncrieffe and Moredun Hill, Perthshire, are rich in old and stately hard-wood trees, and amongst these are many fine oaks. One comparatively young tree of great promise and vigorous habit may be noted. It was planted in January 1822, on the occasion of the rejoicings in connection with the natal day of the late Sir Thomas Moncrieffe. It stands in the centre of the fine old avenue of beech trees already referred to in the chapter on that tree, and is surrounded by the small Druidical circle which had existed there long prior to the planting and laying out of the grounds. It is now 72 feet in height, with a remarkably tall, straight, and clean bole, and is 10 feet 6 inches in girth at 1 foot, and 8 feet 4 inches at 5 feet from the ground. In cursorily noticing the many fine specimen trees in Perthshire, we must not omit to notice those at Methven, where there are some splendid examples of the oak as well as of other descriptions. Especially to be noted is the "Pepperwell Oak." It stands in the park in front of the castle, and is said to derive its name from its proximity to a refreshing spring so called. This tree is noticed in the New Statistical Account of the parish published in 1837. It is therein described as "a tree of great picturesque beauty, and contains 700 cubic feet of wood. The trunk measures 17½ feet in circumference at 3 feet above the ground, and its branches cover a space of 98 feet in diameter. It has attained an increase of girth of 3 feet since the year 1796. In the year 1722, 100 merks Scots were offered for the tree, and tradition reports that there is a stone in the heart of it, but, like the Golenas oak, it must be cut up to ascertain this." In 1867 the tree girthed 21 feet 7 inches at 1 foot from the ground, and 19 feet at 6 feet from the ground. It has, however, considerably increased in bulk since these measurements were taken, and is now at 1 foot from the ground no less in girth than 23 feet, and at its narrowest part, about 5 feet from the ground, it girths 19 feet 5 inches, being thus 2 feet more at this point than it was at 3 feet when it was measured for the record in the New Statistical Account in 1837. It stands by the side of a steep bank, so that the length of the bole is somewhat irregular. On the higher or upper side, it

measures only about 8 feet in length, while on the lower it is nearly 12 feet long. Four immense limbs spring from the bole, and a fifth was wrenched off several years ago. This tree is about 80 feet in height, and is positively known to be at least four hundred years old. An interesting relic of the old Strathallan Forest remains there in the oak given in the returns. This tree is called "Malloch's Oak," from the tradition of a man of that name having been in olden times summarily hanged upon it for storing up and hoarding meal during a time of scarcity. There is still extant the contract of the sale of oak trees in the Castle Wood, where this tree stands, and in which "Malloch's Oak" is strictly reserved. This document is two hundred years old. The tree must then have been a familiarly known old tree, and it is popularly supposed to be from five to six hundred years of age. It is much decayed on one side, but still flourishes in a green old age, the decayed part, which is at a point where a large limb has at one time been taken off, being plated over with iron. It girths 19 feet at 1 foot, and 14 feet 8 inches at 5 feet from the ground. A large horizontal limb, which may have formed a very convenient gibbet if the legend be true, extends 56 feet outwards from the trunk, and is now supported by two posts. Not far from this tree another remarkable and noteworthy oak grows in "the birks of Tullibardine," near the spot where the old castle of that name stood. Tradition reports that under this tree, which is known by the name of "The Chair Tree," the family of Tullibardine, in feudal times, dined and held high revelry on special occasions. It is surrounded by a ring of earthwork resembling an old "*feal dyke*," which is 28 yards in diameter, and in this circus arena it is said the castle horses were formerly trained and exercised. It girths 17 feet at a foot from the ground, and carries this circumference throughout nearly the entire length of its bole, which is 20 feet high. It is apparently not so old as "Malloch's Oak," but apparently also an old "Forest" relic. Near the roadside on the property of Dollerie, and near the right bank of the river Turret, about a third of a mile above its junction with the river Earn, stands a remarkable oak called "Eppie Callum's Oak." The head is wide for its height, and the trunk is very round. It girths 19 feet 8 inches at 1 foot, 15 feet 10 inches at 3 feet, and 15 feet 3 inches at 6 feet above ground. The legend of the name of this tree is that a certain "Eppie Callum," who lived at the place, planted an acorn from some celebrated oak in an old teapot (she must have been a civilized old woman for her day), and when the acorn had produced a rather inconveniently large young plant she planted it, teapot and all, in her kailyard, which occupied the spot at the roadside where the tree now stands. The story



will only be verified by futurity, when the oak comes to be removed, and the remains of the veritable teapot are found embosomed in its trunk! On an oak in the vicinity on the Crieff and Comrie highroad, just opposite Ochtertyre West Lodge, there is a very curious growth or huge wart-like excrescence on an oak tree, worthy of note from its size. It is spheroidal in shape, slightly oblate, with a short axis in supporting branch,—inclination of branch about 45 degrees, girth of the branch 14 inches, and girth of the growth at its widest circumference 6 feet 3 inches.

The oaks in the returns from Glendevon, Perthshire (900 to 950 feet altitude), and from Moreland, Kinross-shire (900 feet altitude), are good specimens for so high a site above sea level, and although the oak is thereby seen to develop less timber-bulk at such a height than in lower situations, it is proved to grow timber there of fine quality, and the constitution of the tree for hardihood to exposure is satisfactorily tested.

The many districts in Perthshire, besides Athole and Dunkeld already referred to, where buried trunks of huge oaks have been found and exhumed, all point to the inference that its entire area, and that of neighbouring shires also, was at an early period one huge impenetrable forest. In the days of the aborigines such vast forests extended all over Scotland, giving to the inhabitants, indeed, their name, for Caledonia originally means the country of "the people of the coverts." These native forests appear to have consisted principally of fir, birch, and oak. In Balquidder large stumps and trunks of a defunct forest of oak are frequently found. In Strathtay fossil wood is often met with, and in the gardens at Murthley Castle, from the bottom of a lake in the American garden, several large oaks have been discovered above 6 feet in girth. Remains of birch, alder, hazel, were also found in a tolerable state of preservation in this lake bottom. Glenmore, a narrow valley in the parish of Fortingall, was in early times part of the extinct Forest of Schiehallion; and for a long period the stumps of fir trees, and large trunks of oak, furnished the inhabitants of the district with a profitable product,—the fir being used as fuel, when it is stated to have "emitted a light more brilliant than gas," while the oak wood, on being dried and exposed, proved so hard as to be manufactured into sharpening tools for scythes which were readily marketable. In the bed of the Tay frequently large oaks have been found *in situ*, and in good preservation.

But returning from this digression, and having in considerable detail noticed the remarkable oaks of Perth and the more northern districts of Scotland, we hasten briefly to direct attention to the trees in other counties further south. At Tullibody House, Clackmannan, there is a very handsome oak of immense

trunk, girthing 21 feet 11½ inches at 1 foot, and 18 feet 3 inches at 5 feet from the ground. It is acknowledged to be by far the largest tree of the kind in the parish and district around. This tree is quite vigorous, and has grown 7 inches in girth at 3 feet from the ground since October 1870. The oaks at Pollok, in the parish of Eastwood, Renfrewshire, are notable examples, and have been carefully measured from time to time since 1812, and the following results of their growth ascertained at 5 feet above ground.

Tree.	Situation.	1812.	1823.	1836.	1842.	1858.	1862.	1880.
		ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
No. 1.	Above Iron Gate, Pollok	7 6	...	...	9 2	9 9½	10 0	11 6
„ 2.	East of Flower Gardens	8 9	...	...	10 2½	10 9	10 10½	12 4½
„ 3.	Garnockfield .....	7 9	8 3½	9 3	9 8½	10 1	10 3	11 9
„ 4.	North of Pollok House..	6 10	...	...	8 8	9 5½	9 7	10 1
„ 5.	Shawholm .....	...	...	...	...	11 0½	11 3½	13 0½

Ayrshire can boast many fine examples of the oak, and there also it appears to have flourished at a very early period in great luxuriance and forest grandeur. In Galston parish, in that county, good trees appear to have covered the area of the country at a remote age, and many fine specimens exist at the present day. An oak trunk was some years ago found embedded in the ground, about 500 feet above sea level, having a straight massive bole, 48 feet in length and 10 feet 6 inches in girth at its upper extremity. Lanfine Woods, Barr Castle, Cessnock Castle, Auchans Castle, Loudon Castle and woods, Auchinleck, and Sorn Castle still maintain, by their many lordly trees, the reputation of the county.

In Lanarkshire there are many interesting and remarkable old oaks. We may first notice "The Pease Tree," growing on the estate of Lee in the parish of Lanark. It stands in a hollow, originally the outlet of the burn or rivulet, which has formed in the soil and subsoil a deep ravine, or *gill* as it is locally termed. The soil is a medium loam with beds of sand and gravel resting on the usual sandstone, shale, &c., of the coal formation. The trunk of this veteran is now quite hollow, and, at the height of about 8 feet from the present surface of the ground, forms itself into three branches, girthing respectively 16 feet 8 inches, 15 feet, and 11 feet 4 inches. Parts of these massive limbs are more or less decayed, and standing boldly out as they do, weather-beaten and divested of their bark, from amongst the living branches when clothed in their summer greenery, give to this noble tree a reverential dignity and grandeur well befitting an artist's study, and carrying the mind of the beholder back through long centuries of changes and revolutions which have taken place

in the history of Caledonia, since the genial sun and rains first called forth the nature-sown acorn to send down its tiny rootlets into mother earth. "The Pease Tree" is said to be one of the few remaining scattered remnants of the great Caledonian Forest, which stretched across the centre of the lowlands of Scotland from Ayrshire to St Abb's Head on the German Ocean, and in which it is said the Roman Emperor Severus kept 50,000 men for seven years cutting down trees, in order to prevent the forest affording shelter to the natives. The name "Pease Tree," is popularly and locally believed to have been given to this tree from the pease grown on the adjoining farm being annually stacked around and upon it for the purpose of being winnowed; but the name more probably derived its origin from the situation in which the tree grows, from *paes* or *pis*, an old British word signifying a rivulet or spout. Tradition says that Oliver Cromwell and a party of his followers dined in the hollow part of the trunk, and also that in a former era a lady of the family of Lee was in the habit of plying her spindle and distaff there. It is satisfactory to record that this venerable tree appears to be growing more luxuriantly than it did some years ago, from the fact that an oak was planted merely to occupy its place when the hand of time or the blasts of winter should have completed their work. This tree is now 7 feet in girth at 3 feet from the ground, and the entrance to the hollow butt of the old tree is yearly growing smaller, so that in a few years a man will have great difficulty in getting an entrance. The dimensions of this remarkable tree are as follows:—Height 68 feet; circumference at 1 foot 28½ feet, at 3 feet 23 feet, and at 6 feet 28½ feet. It appears to be *Quercus sessiliflora*, while the oak planted to occupy its place is *Quercus pedunculata*. The most interesting and important groups of old oaks in Lanarkshire are the trees remaining in Cadzow Forest, near Hamilton Palace. The forest is the property of His Grace the Duke of Hamilton, and lies in a gently sloping position towards the north. The two enclosures now known as the Lower and Upper Oaks, the former containing 70 acres, the latter 83 acres, form together part only of the old forest, because adjoining these remains on the south and west are old pasture fields and plantations, surrounded by a stone wall 6 feet high and about 3 miles in extent, which was most probably the boundary in feudal times, when Cadzow Castle was the scene of many stirring and knightly events. On the east side the forest is bounded by the river Avon, and on the left bank of this river are the moss-covered crumbling ruins of Cadzow Castle. The soil is admirably adapted for the growth and development of oaks, being a clayey loam resting on a sub-soil of clay. In some places the trees stand quite close together, while in others they stand singly, or seem to surround large open

patches covered with rich natural pasture, on which the famous "breed" of native wild white cattle browse, and form an appropriate association with this ancient relic of Caledonian forest life. The principal characteristic of all these trees is their shortness of stature, combined with great girth of trunk. The dimensions of ten of the largest and best specimens are given in the appended returns. Most of the trees, and even the healthiest amongst them, are fast hastening to decay. No planting, pruning, nor felling is allowed within the forest. Tradition states that these oaks were planted about the year 1140, by David Earl of Huntingdon, afterwards king of Scotland; but this cannot be looked upon as a fact, for their appearance and habit clearly point to their *self-sown* existence, and, moreover, in the remote period assigned to them by the legend, little if any attention was paid to the planting of trees, and the clearing of the native forests was held in far higher importance than the planting of them.

Another interesting remnant of the old Caledonian Forest still exists in Midlothian at Dalkeith Park. This portion embraces 130 acres, and has been most carefully preserved for centuries, its hoary and gnarled giants being still fresh and vigorous, and likely to flourish for generations to come. The survival of this ancient tract of woodland is all the more to be prized when it is recorded that, about one hundred and fifty years ago, the then owner of the ducal demesne had determined that the trees should be cut down, and accordingly most of the old trees still standing were marked for the axe, but by the sudden death of their owner, the intended *improvements* were stayed, and the forest thus providentially escaped annihilation. The mark or "blaze" then cut on the sides of the trees in the course of years healed over, and became invisible, but its position is still distinctly seen upon the rugged bark of these hoary monarchs after the lapse of a century and a half; and the figures scribed on the "blaze" in lotting and numbering the trees were still quite legible upon the removal of the superimposed bark, in cutting up one of the trunks recently blown down. The dimensions of the "King of the Forest," the largest survivor in the group, are given in the appended returns. Many other trees closely approach this monarch in size,—some of the specimens having straight clean stems, others having no bole to speak of, and all with rugged, swollen, and curiously knotted trunks, with fantastically twisted, gnarled, and contorted gaunt-like arms and branches. The timber of these trees is remarkably rich in colour, and beautifully grained, and even trunks blown down—no felling being permitted—fetch high prices, so eagerly sought after is their timber by cabinetmakers for decorative furniture.

Remains still may be traced in Selkirk and Peebles-shires of the old Ettrick Forest, which formed another division of the great

Caledonian Forest. In the still richly wooded lands of Castle-craig, Dalwick, and Posso, in reclaiming land, oak trunks are still dug out, and are found strewn together as if they had been overthrown by some flood or angry tempest.

The remarkable oaks at Lochwood, and in other places in Dumfriesshire and south of Scotland, have already been noticed, and reference to others of equal interest may be permitted to the appended returns; but before concluding this report on the old oaks of Scotland, it would be unpardonable if we did not notice one still existing at Moffat, and interesting from the fact that we owe its existence at the present day to that eminent and enthusiastic tree-lover, whose early records and notices of trees we have so frequently quoted and referred to. This tree stands upon a slope on the west side of the Annan, near the Dumfries road, to the south of Moffat. It is a fine old oak, massive, knotted, and gnarled, with wide-spreading branches, and head finely foliated in summer. It is called "The Gowk Tree," and Dr Walker, with true affection for its associations, in the early part of this century secured its preservation by a considerable money payment, when the whole of the forest trees on the bank were cut down by the curators of the Marquis of Annandale, because it was in that tree the cuckoo annually first heralded the advent of spring in the parish. Although it lost a great limb about twenty-five years ago,—almost as large as many a well-grown oak tree,—it is still fresh and vigorous.

The returns appended to this report will be found to describe the particulars of many trees which have not been referred to in this paper, nor, indeed, previously recorded at all; they are stately and noble specimens, in their different localities, of "the forest's old aristocrats," each of which

"Takes back  
The heart to elder days of holy awe."

To give a detailed account, or even to name the various oaks in England, remarkable for their size or for their historical associations, many of which still exist, would occupy more space than the limits of a chapter devoted to the old remarkable oaks in Scotland would allow; but it may render this chapter more complete if a brief reference is made to some of the most important of them. They are "full of story, and haunted by the recollections of the great spirits of past ages." In Norfolk, "the country of oaks," is still to be seen the ruined relic of Winfarthing oak, which in 1820 is said to have measured "70 feet in girth at the root and 40 feet in the middle." It is said to have been known in the time of the Conqueror as "the Old Oak," and its age is popularly believed to be over 1500 years. The largest and oldest oak tree in Windsor Forest, "the King

Oak," measures 26 feet in circumference at 4 feet from the ground. "The Great Oak" of Thorpemarket, still in healthy vigour, but evincing great age, girths at 1 foot from the ground 22 feet, and has a bole 42 feet in length, and is 70 feet in height. In Kent, "the Majesty Oak," at Fredville, girths 28 feet 6 inches at 8 feet above ground. In Nottinghamshire, "the Parliament Oak" in Clipstone Park, is 28 feet 6 inches in girth at 4 feet from the ground. Under this tree, in 1290, Edward I. held a parliament, whence its name is derived. "The Shelton Oak," near Shrewsbury, still exists, and is fully 26 feet in girth at 5 feet from the ground. This tree is celebrated from its having been climbed by Owen Glendower on 21st June 1403, that he might reconnoitre the battle of Shrewsbury on his arrival with supports. In Bagot's Park, Staffordshire, is a majestic oak tree, 28 feet in girth at 5 feet from the ground. The celebrated "Cowthorpe Oak" in Yorkshire, said to be the largest tree in England, still lingers on in hoary grandeur. Near the ground the stump girths no less than 78 feet, while it is 48 feet in girth at 3 feet above ground. It is quite hollow—in fact a mere shell, uncared for, and tenanted by cattle in their quest for shade or shelter. Eighty-four persons are stated on one occasion to have stood within its hollow trunk, and it could have accommodated a considerable number more. Many fine majestic oaks still thrive at Chatsworth, in Derbyshire, and at Lyme Hall, in Cheshire. These are relics of the old High Peak forest. Some of the measurements made by us in 1876 were as follows:—

Place.	No.	Height of Tree.	Bole.	Girth at 1 foot.	Girth at 5 feet.	Remarks.
		Ft. in.	Ft. in.	Ft. in.	Ft. in.	
Chatsworth .....	1	110 0	23 0	20 3	18 1	{ Looks vigorous, but is hollow in bole.
" .....	2	95 4	20 0	29 4	24 2	{ Showing signs of decaying in trunk.
" .....	3	98 0	16 0	25 8	23 9	{ Good healthy head.
Lyme Hall .....	1	80 0	22 0	17 4	15 5	{ Quite hollow, but has healthy young shoots.
" .....	2	65 0	15 0	19 9½	17 8	{ Side shoots healthy, but trunk hollow.
" .....	3	72 0	35 0	17 7	14 6	{ Has lost top.
" .....	4	53 0	10 0	21 3	17 2	{ Trunk has been split by light- ning.
" .....	5	75 0	19 0	22 7	16 8	{ Seems decaying.
" .....	6	86 0	23 0	21 9	17 8	{ Quite vigorous.

These data may be interesting, as the trees last referred to do not appear to have been hitherto recorded.

In conclusion, we would merely refer those interested in comparing the other remarkable oaks in England with those we have herein recorded in Scotland, to the interesting and valuable pages of the *Amoëntates quernice* of the late Professor Burnet, in which the historical facts, legends, and traditions connected with the history of individual oaks of ancient date are fully given.

## APPENDIX—DESCRIPTION OF THE

County.	Place.	Altitude above Sea-level.	Soil.	Subsoil.	Exposure of Site.
Moray,	Altyre, .	Ft. in. 80 0	Light loam, .	Sandy gravel, .	Sheltered,
"	"	"	"	"	Sheltered,
"	Darnaway Castle, .	200 0	Sandy loam, .	Sand on freestone, .	...
"	"	"	"	"	...
"	"	"	"	"	...
"	"	"	"	"	...
"	Brodie Park, .	150 0	Black sandy loam, .	White sand & clay, .	N.E.
"	"	"	"	"	N.E.
"	"	"	"	"	N.E.
"	"	"	"	"	N.E.
Ross,	Brahan Castle, .	...	Black heavy loam, .	Sand and gravel, .	S. & W.
"	"	...	"	"	S. & W.
Forfar,	Kinnaird, .	30 0	Deep loam, .	Sand and gravel, .	...
"	"	"	"	"	...
"	"	50 0	"	"	...
"	"	30 0	"	"	...
"	Gray, .	200 0	Deep clayey loam, .	Sandy and gravel, .	Sheltered,
Perth,	Innertyie, .	...	Deep rich loam, .	Clay and gravel, .	Sheltered,
"	Taymount, .	100 0	Black loamy, .	"	...
"	Balboughty, .	120 0	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
"	Scone Policies, .	50 0	"	"	...
"	Castle Menzies, .	250 0	Light loam, .	Gravel, .	W.
"	"	"	"	"	W.
"	Birnam, .	...	Good loam, .	"	Sheltered,
"	Dunkeld, .	...	"	Clay and gravel, .	Sheltered,
"	"	...	"	"	W.
"	"	...	"	"	W.
"	Moncrieffe, .	...	Light loam, .	Gravel, .	...
"	"	...	"	"	S.
"	Drummond Park, .	...	Clayey loam, .	Gravel and moss, .	...
"	"	...	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
"	"	...	"	"	...
"	Muthill, .	...	"	"	...
"	Drummond Wood, .	...	"	"	...
"	Kincairney, .	500 0	Stiff loam, .	Hard stony clay, .	S.W.
"	Methven, .	...	Good loam, .	Clay, .	...

BRITISH OAK (*Quercus pedunculata* et *sessiliflora*).

Height of Tree.	Length of Bole.	Present Circumference of Trunk at			Any former recorded Measurements and Dates.			Diameter of Spread of Branches.	REMARKS.
		1 foot.	3 feet.	5 feet.	Date.	At 1 Foot.	At 3 Feet.		
Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.		Ft. in.	Ft. in.	Ft. in.	
60 0	15 0	16 2	...	13 6	...	...	...	99 0	
70 0	30 0	16 9	...	13 8	...	...	...	77 0	
75 0	20 0	20 5	...	...	...	...	...	...	
68 0	18 0	20 6	...	...	...	...	...	...	Forks into two limbs at 5 ft.
70 0	20 0	20 5	...	15 0	...	...	...	...	
65 0	20 0	27 9	...	...	...	...	...	...	Sprung from oak stool.
64 0	10 0	18 8	...	15 0	...	...	...	...	
85 0	18 0	11 6	...	10 6	...	...	...	...	
50 0	30 0	15 0	...	12 1	...	...	...	...	
70 0	25 0	15 3	...	12 0	...	...	...	...	
71 0	35 0	16 0	...	12 11	...	...	...	...	{ Planted between 1650 and 1680.
82 0	10 0	16 3	16 0	17 10	...	...	...	...	
80 0	25 0	19 3	...	16 2	...	...	...	...	
52 0	9 0	14 0	...	15 2	...	...	...	...	{ Highly ornamental tree—spreading.
45 0	12 0	12 10	...	12 10	...	...	...	...	{ Very handsome and wide-spreading head.
62 0	32 0	10 8	...	8 2	...	...	...	...	
63 0	36 0	11 4	...	9 5	...	...	...	...	
65 0	18 0	26 2	...	17 2	...	...	...	116 0	{ Contains 623 cubic feet of timber.
76 0	30 0	...	...	20 10	...	...	...	...	
80 0	20 0	...	...	12 11	...	...	...	...	
83 0	56 0	...	...	5 7	...	...	...	...	{ Planted in 1808 ( <i>Q. sessiliflora</i> ), contains 76 cubic feet of timber.
82 0	58 0	...	...	7 1	...	...	...	...	{ Planted in 1809 ( <i>Q. sessiliflora</i> ), contains 93½ cubic feet of timber.
80 0	57 0	...	...	6 11	...	...	...	...	{ Planted in 1809 ( <i>Q. pedunculata</i> ), contains 114 cubic feet of timber.
55 0	...	15 3	14 2	13 4	...	...	...	75 0	{ Planted by King James VI. of Scotland.
70 0	40 0	10 4	...	8 4	...	...	...	...	{ Planted in 1809.
73 0	30 0	15 3	13 4	12 0	...	...	...	...	{ Grows near the pond.
80 0	20 0	14 3	...	11 3	...	...	...	...	{ At east gate.
85 0	10 0	28 10	20 1	17 8	...	...	...	90 0	{ Last remnant of Birnam Wood.
100 0	30 0	14 0	...	12 8	...	...	...	...	{ Grows near the parent larches.
70 0	12 0	...	15 8½	15 2½	...	...	...	99 0	{ Close to wire fence in field near the American Garden.
...	...	...	...	...	...	...	...	...	{ "Nail Gow's Oak."
72 0	35 0	10 6	...	8 2	...	...	...	...	{ Growing in centre of druidical circle.
90 0	20 0	17 7	...	12 5	...	...	...	75 0	
96 0	26 0	14 5	...	10 9	...	...	...	...	
66 0	9 0	17 6	...	17 7	...	...	...	...	
45 0	11 0	10 10	...	15 8	...	...	...	...	
70 0	12 0	19 6	...	14 8	...	...	...	114 0	
81 0	14 0	18 4	...	10 1	...	...	...	77 0	
64 0	17 0	14 3	...	11 0	...	...	...	73 0	
73 6	21 6	18 7	...	11 10	...	...	...	100 0	
64 0	13 0	14 0	...	9 7	...	...	...	77 0	
58 4	21 4	10 7	...	9 9	...	...	...	...	
70 0	10 0	...	11 6	...	...	...	...	...	
82 0	10 0	23 0	19 9	19 5	...	...	...	98 0	



## DESCRIPTION OF THE

County.	Place.	Altitude above Sea-Level.	Soil.	Subsoil.	Exposure of Site.
		Ft. in.			
Perth,	Strathallan,	150 0	Red clay loam, .	Thil, . . .	...
"	"	200 0	Black loam, sandy,	Thil, . . .	...
"	Octertyre,	200 0	Light earthy, .	{ Gravel and sand } over rock,	...
"	Dollerie,	1200 0			...
"	Glendevon, .	900 0	Clayey loam, .	Gravel and rock,	"E. S.E.
"	"	950 0	"	"	"
"	Kippenross,	...	"	"	...
Kinross,	Moreland, .	900 0	Damp reddish loam,	Clay, . . .	S.W.
"	"	"	"	"	...
"	"	"	"	"	...
"	Kinross House, .	...	Light red loam, .	Clay and gravel,	...
Fife,	Donibristle, .	90 0	Stiff loam, .	Clay, . . .	...
Stirling,	Leckie, .	120 0	Light loamy, .	Red freestone rock,	...
"	"	"	"	"	...
"	"	"	"	"	...
"	Airth Castle, .	50 0	Heavy loam, .	Clay, . . .	S. S.
"	"	"	"	"	"
Clackmannan,	Tullibody House,	70 0	Clayey loam, .	Red clay, . .	Sheltered,
"	"	"	"	"	Sheltered,
Argyllshire,	Inveraray Castle,	100 0	Brown loam, .	Sandy gravel, .	S.E.
Renfrewshire,	Pollok, . . .	120 0	Alluvial loam, .	Sandstone, . .	S.W.
"	"	"	"	"	S.W.
"	"	"	"	"	S.W.
"	"	"	"	"	S.W.
"	"	"	"	"	S.W.
Ayrshire,	Auchans Castle,	...	Light loam, .	Gravel, . . .	W.
"	"	"	"	"	...
"	Loudon Castle, .	185 0	Loamy, . . .	Sandy, . . .	Open,
"	Kirkmichael, .	...	Light loam, .	Gravel and sand,	Open,
"	"	"	"	"	Open,
"	Eglinton, . .	50 0	Light loam, .	Clay, . . .	S.W.
"	Sorn Castle, .	400 0	Thin light soil, .	Stiff clay, . .	W.
"	"	"	"	"	W.
Dumbarton,	{ Luss, Lochlomond } { (Inch Murrain), }	...	Light dry soil, .	Gravelly, . .	W.
"	"	...	"	"	W.
"	"	...	Sandy loam, .	Whinstone, .	E.
"	"	...	"	"	...
"	"	...	Damp heavy loam,	Damp clay, .	...
"	"	...	Deep humid soil,	Clay, . . .	...
Lanark,	Lee, . . .	...	Medium loam, .	Sandstone & shale,	S.
"	Cadzow Forest, .	...	Clayey loam, .	Clay, . . .	N.
"	"	...	"	"	N.
"	"	...	"	"	N.
"	"	...	"	"	N.
"	"	...	"	"	N.
"	"	...	"	"	N.
"	"	...	"	"	N.
"	Dalziel, . . .	...	Stiff clay loam, .	Clay, . . .	Open,

## BRITISH OAK—continued.

Height of Tree.	Length of Bole.	Present Circumference of Trunk at			Any former recorded Measurements and Dates.			Diameter of Spread of Branches.	REMARKS.
		1 foot.	3 feet.	5 feet.	Date.	At 1 Foot.	At 3 Feet.		
Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.		Ft. in.	Ft. in.	Ft. in.	
50 0	15 0	19 0	...	14 8	...	...	...	...	Is called "Malloch's Oak."
60 0	0	17 0	...	16 6	...	...	...	...	"The Chair Tree."
...	...	19 8	...	17 2	...	...	...	...	
55 0	...	19 8	15 10	15 8	...	...	...	...	"Eppie Callum's Oak."
50 0	25 0	7 8	...	5 11	...	...	...	...	{ Growing vigorous at this high elevation. Site very damp.
45 0	30 0	6 5	...	5 6	...	...	...	...	{ Many others here girth from 10 ft. to 11 ft. at 5 ft. from ground.
63 0	20 0	12 3	...	11 1	...	...	...	...	{ The best oaks in this high district.
55 0	15 0	7 8	...	6 1	...	...	...	...	
45 0	12 0	6 9	...	5 7	...	...	...	...	
50 0	6 0	7 5	...	6 2	...	...	...	...	
...	...	12 2	...	9 0	...	...	...	...	
76 0	35 0	13 6	...	10 10	...	...	...	58 0	
80 0	17 0	14 1	...	11 9	...	...	...	...	
69 0	18 0	14 3	...	10 10	...	...	...	...	
76 0	21 0	14 3	...	10 2	...	...	...	...	
70 0	18 0	13 8	...	12 3	...	...	...	...	
65 0	23 0	13 2	...	12 0	...	...	...	...	
80 0	12 0	21 11½	19 7	18 3	...	...	...	...	{ In 1870, girthed 19 ft. at 3 ft. The largest tree in the parish.
73 0	20 0	20 2	14 3	12 3	...	...	...	...	{ In 1870, girthed 13 ft. at 3 ft. Very vigorous.
85 0	20 0	15 9	...	13 1	...	...	...	...	
70 0	...	14 3	...	12 6	...	...	...	...	
82 0	...	15 9½	...	13 4½	...	...	...	...	{ Measurements taken at different times since 1812, are given in the Report.
64 0	...	15 1	...	12 9	...	...	...	...	
68 0	...	14 2	...	12 1	...	...	...	...	
62 0	...	15 11	...	13 9½	...	...	...	...	
60 0	...	27 6	...	...	...	...	...	...	{ Branches at 1 ft. into seven hands, and is called "The Seven Sisters."
80 0	30 0	15 9	...	12 3	...	...	...	...	{ Grows in gamekeeper's garden.
65 0	14 0	14 9	...	10 7	...	...	...	...	
70 0	14 0	14 6	...	12 0	...	...	...	90 0	
72 0	18 0	11 9	...	9 8	...	...	...	...	
70 0	18 0	14 6	...	10 8	...	...	...	62 0	
75 0	33 0	10 2	...	8 3	...	...	...	...	
60 0	18 0	8 0	...	7 11	...	...	...	...	Behind coach-house. Near "Peden's Cave."
45 0	7 0	...	...	14 3	...	...	...	88 0	{ Divides into two limbs at 7 ft. "
50 0	7 0	...	...	17 6	...	...	...	111 0	{ Divides into three limbs at 7 ft. "
45 0	30 0	...	...	12 10	...	...	...	...	{ Contains 270 cubic feet of timber
60 0	15 0	...	...	11 9	...	...	...	...	
55 0	5 0	...	...	...	...	...	...	100 0	{ 21 ft. 9 in. at 2 ft. from ground; very vigorous, very spreading.
50 0	4 0	...	...	...	...	...	...	85 0	{ 22 ft. 6 in. at 2 ft. from ground; short stemmed branching tree.
68 0	8 0	28 6	23 0	28 6	...	...	...	...	"The Pease Tree." ( <i>Q. sessiliflora</i> ).
48 0	30 0	...	26 7	22 9	...	...	...	100 0	
45 0	12 0	...	21 10	21 0	...	...	...	66 0	
35 0	18 0	...	18 6	21 3	...	...	...	77 0	
38 0	13 0	...	17 8	20 0	...	...	...	68 0	
50 0	30 0	...	16 8	13 0	...	...	...	74 0	
46 0	20 0	...	15 8	14 3	...	...	...	87 0	
49 0	33 0	...	13 8	13 9	...	...	...	62 0	
...	...	21 4	...	19 3	...	...	...	70 0	{ Very characteristic and picturesque representations of some of the trees in Cadzow Forest.

## DESCRIPTION OF THE

County.	Place.	Altitude above Sea-Level.	Soil.	Subsoil.	Exposure of Site.
		Ft. in.			
Linlithgow,	Hopetoun, . .	120 0	Good loam, .	Gravelly clay, .	E.
"	"	"	"	"	E.
"	"	"	"	"	N.E.
"	Niddry Castle, .	180 0	"	"	Open,
"	Carlowrie, . .	92 0	Heavy loam, .	Clay, " . .	S.W.
Midlothian,	Calder House, .	"	Good light soil, .	Gravel and sand, .	S.W.
"	Ingliston, . .	100 0	"	"	S.
"	Cramond House, .	60 0	Alluvial loam, .	"	Sheltered,
"	Woodhouselee, .	700 0	Loamy, . .	Gravel and rock, .	Sheltered,
"	"	...	"	"	S.E.
"	Dalkeith Park, .	120 0	Good deep loam, .	Clay and gravel, .	Sheltered,
"	Melville Castle, .	200 0	Sandy loam, .	Gravel, . .	N.
"	"	150 0	Good yellow loam, .	Sandy clay, . .	Sheltered,
"	"	200 0	Sandy loam, .	Sand and gravel, .	N.W.
"	"	150 0	Good loam (deep)	Loamy, . .	Sheltered,
"	"	200 0	Sandy loam, .	Gravel, " . .	Sheltered,
"	"	...	Friable loam, .	Clay and gravel, .	N.
Peeblesshire,	Penicuik House, .	860 0	Light sandy, .	Clay and gravel, .	...
"	Castle Craig, .	860 0	"	"	S.W.
"	Dalwick, . .	600 0	Sandy loam, .	Gravelly, . .	...
"	"	...	"	"	...
"	"	...	"	"	...
"	Stobo Castle, . .	720 0	Good loam, .	Clay, . . .	...
Haddington,	Gilmerton, . .	100 0	Leaf mould, .	{ Very poor clay } and stony, .	Open,
"	"	"	"	"	Open,
"	"	"	"	"	Open,
"	Yester, . . .	400 0	Clayey loam, .	Red sandstone, .	E.
"	"	"	"	"	S.W.
"	"	"	"	"	W.
"	Ormiston Hall, .	...	Strong loam, †	Clay, . . .	E.
"	Whitinghame, .	350 0	Red clay loam, .	Sandstone, . .	Open,
"	"	"	"	"	Open,
"	"	"	"	"	Open,
"	Tynninghame, .	60 0	"	Gravel and sand, .	Open,
"	"	"	"	"	Open,†
"	"	"	"	"	Open,
"	"	"	"	"	Open,

BRITISH OAK—*continued.*

Height of Tree.	Length of Bole.	Present Circumference of Trunk at			Any former recorded Measurements and Dates.			Diameter of Spread of Branches.	REMARKS.
		1 foot.	3 feet.	5 feet.	Date.	At 1 Foot.	At 3 Feet.		
Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.		Ft. in.	Ft. in.	Ft. in.	
90 0	56 0	13 9	...	10 8	...	...	...	...	{ There is a cluster of oaks here, growing in the Deer Park, averaging 123 ft. in height, with clean stems of 60 ft. in length. A splendid massive tree.
80 0	50 0	14 2	...	11 9	...	...	...	...	
110 0	93 0	11 9	...	8 8	...	...	...	...	
85 0	35 0	17 9	...	12 8	...	...	...	...	{ A very handsome tree, with fine clean bole.
84 0	13 0	11 6	10 9	8 9	...	...	...	...	
60 0	11 0	11 1	10 0	9 2	...	...	...	...	
40 0	20 0	13 2	...	10 4	...	...	...	...	{ Planted about beginning of eighteenth century. "The King of the Forest." Remnant of the old Caledonian Forest, of which about 130 acres still remain.
80 0	35 0	17 3	12 10	12 6	...	...	...	...	
78 0	30 0	17 6	...	16 0	...	...	...	...	
80 0	...	10 0	...	8 10	...	...	...	...	{ 16 ft. 2 in. at 12 ft. above ground. "Queen Mary's Oak." Grows in a valley. Growing in valley. Do.
65 0	...	11 4	...	8 4	...	...	...	...	
93 0	20 0	18 4	...	15 4	...	...	...	...	
45 0	10 0	15 9	...	12 1	...	...	...	...	{ In 1846, girthed 13 ft. 10 in. at 1 ft., west of mansion-house. Contains 120 cubic feet. East side of mansion-house. Has lost a heavy limb on east side. Near Bowling-Green. A very fine tree. Girthed in 1846 9 ft. 5 in. at 2 ft. up. Grows in the Home Park near Mill.
48 0	17 10	20 10	...	19 11	...	...	...	...	
70 0	12 6	12 3	...	10 1	...	...	...	...	
48 0	16 10	12 10	...	12 10	...	...	...	...	{ Stands south of house. Very fine park tree. At garden. Divides into two limbs, and is much weather-beaten and shattered. In avenue. A very fine tree but is "one-sided."
50 0	17 10	12 8	...	9 7	...	...	...	...	
40 0	10 5	12 11	...	9 8	...	...	...	...	
60 0	...	12 8	...	10 3	...	...	...	...	{ Many more here of similar dimensions. A fine ornamental park tree. Opposite churchyard gate. In pleasure grounds of Policies near house and stables.
55 0	18 0	11 9	...	9 6	...	...	...	...	
80 0	42 0	14 9	...	10 8	...	...	...	...	
57 0	33 0	17 6	...	10 10	...	...	...	...	{ Many more here of similar dimensions. A fine ornamental park tree. Opposite churchyard gate. In pleasure grounds of Policies near house and stables.
80 0	...	...	14 10	...	...	...	...	...	
80 0	35 0	11 8	...	9 4	...	...	...	...	
66 0	33 0	12 7	...	9 2	...	...	...	...	{ Many more here of similar dimensions. A fine ornamental park tree. Opposite churchyard gate. In pleasure grounds of Policies near house and stables.
81 0	21 0	14 1	...	9 10	...	...	...	...	
56 0	24 0	13 7	...	10 10	...	...	...	...	
75 0	29 0	18 0	...	14 9	...	...	...	...	{ Many more here of similar dimensions. A fine ornamental park tree. Opposite churchyard gate. In pleasure grounds of Policies near house and stables.
70 0	15 0	17 8	...	14 10	...	...	...	...	
85 0	38 0	15 7	...	14 8	...	...	...	...	
65 0	18 0	14 9	...	12 1	...	...	...	...	{ Many more here of similar dimensions. A fine ornamental park tree. Opposite churchyard gate. In pleasure grounds of Policies near house and stables.
70 0	19 0	14 8	...	11 8	...	...	...	...	
75 0	25 0	...	10 0	9 3	...	...	...	...	
82 0	40 0	8 7	...	7 4	...	...	...	...	{ Many more here of similar dimensions. A fine ornamental park tree. Opposite churchyard gate. In pleasure grounds of Policies near house and stables.
80 0	50 0	13 9	...	10 8½	...	...	...	...	
76 0	32 0	13 11	...	9 1	...	...	...	...	
70 0	33 0	13 5	...	9 0	...	...	...	...	{ Many more here of similar dimensions. A fine ornamental park tree. Opposite churchyard gate. In pleasure grounds of Policies near house and stables.
70 0	35 0	11 9	...	8 1	...	...	...	...	

## DESCRIPTION OF THE

County.	Place.	Altitude above Sea-Level.	Soil.	Subsoil.	Exposure of Site.
		Ft. in.			
Haddington,	Binning Wood, . .	60 0	Sandy loam, .	Sandy, . .	Sheltered
"	"	"	"	"	Sheltered
"	"	"	"	"	Sheltered
"	"	"	"	"	Sheltered
"	Pressmennan, .	700 0	Sandy loam, .	Gravel and rock,	W.
"	"	"	"	"	W.
"	Dunglass, . .	...	Good loam, .	Gravelly till, .	N.
Berwickshire,	Kimmerghame, .	...	Black loam, .	Strong clay . .	N.
Roxburghshire	Floors Castle .	...	Deep strong loam,	Blue clay, . .	S.
"	"	...	"	"	S.
"	Springwood Park,	...	"	Clayey loam, .	Open,
"	"	...	"	"	Open,
Dumfries,	Springkell, . .	235 0	Light loam, .	Sandy, . .	Sheltered
"	"	225 0	"	Sand and gravel,	Open,
"	Lochwood, . .	900 0	Light sandy, .	Gravel, . .	S.E.
"	"	...	"	"	...
"	Barfarg, . .	...	Friable loam, .	Gravel and sand,	...
"	Drumlanrig, .	...	"	"	...
"	"	...	"	"	...
"	Closeburn, . .	...	Light loam, .	Clayey, . .	...
Kirkcudbright,	Kenmure, . .	...	Light loam, .	Gravelly, . .	...

BRITISH OAK—*continued.*

Height of Tree.	Length of Bole.	Present Circumference of Trunk at			Any former recorded Measurements and Dates.			Diameter of Spread of Branches.	REMARKS.
		1 foot.	3 feet.	5 feet.	Date.	At 1 Foot.	At 3 Feet.		
Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.		Ft. in.	Ft. in.	Ft. in.	
85 0	40 0	...	8 11	8 2	}	...	...	...	{ These are remarkable instances of successful planting, quite within the influence of the sea breeze, the Firth of Forth being not half a mile distant.
90 0	37 0	...	11 5	9 11					
100 0	50 0	11 9	...	11 2					
108 0	20 0	...	11 9	11 6					
70 0	35	...	9 7	8 10	...	...	...	...	{ Is 9 ft. 8 in. at 9 ft. from ground. Wide broad-headed tree.
60 0	25 0	...	8 11	8 10	...	...	...	...	
95 0	50 0	12 7	...	8 5	...	...	...	...	{ Many more similarly sized fine oaks here.
85 0	30 0	...	11 8	...	...	...	...	...	{ A very picturesque park tree.
60 0	40 0	13 2	...	10 8	...	...	...	...	
70 0	40 0	14 1	...	11 8	...	...	...	...	
100 0	35 0	17 5	...	16 0	}	...	...	...	{ Many more old oaks here of similar size and dimensions. They suffered severely in their young wood of from one to four years old by the winter's frost of 1879-80.
95 0	40 0	15 10	...	15 0					
74 0	12 0	13 7	...	11 5	...	...	...	...	{ In avenue near Palmeragill gate.
45 0	12 0	13 11	...	12 2	...	...	...	...	In Burnfoot Holm.
...	12 10	19 8	...	18 10	}	...	...	...	{ The first is on the roadside north of old Castle, and the second to the south-east of it. Noticed by Dr Walker in his list, and referred to in Reports.
...	19 2	24 0	...	20 0					
...	...	19 3	...	16 3	...	...	...	60 0	{ "The Blind Oak of Keir"—the finest oak in untries-shire. Further details are given in this Report.
84 6	24 0	23 0	...	14 7	...	...	...	77 0	{ West side of road at "Doo-Cot Knowe."
50 0	8 0	14 0	...	...	...	...	...	...	Close to Castle.
80 0	31 0	17 8	...	15 2	...	...	...	...	{ Girths 11 ft. at 15 ft. above ground.
60 0	25 0	14 2	...	11 3	...	...	...	...	{ Many other fine large specimen trees here.

ON THE COMPARATIVE ADVANTAGES OF GRAZING CATTLE  
AND SHEEP TOGETHER OR SEPARATELY UPON PER-  
MANENT PASTURES.

By DUNCAN CLERK, Writer, Oban.

*[Premium—Ten Sovereigns.]*

ACCORDING to the Board of Trade returns for the year 1879, the number of cattle in Scotland amounted to 1,083,601, and the number of sheep to 6,838,098.

There is an immense amount of capital invested in all this live stock, and still it is not too much. The well-being of the population generally, more especially of the working classes, depends greatly on their having a sufficient supply of butcher-meat; and that being so, the question as to the production of the greatest quantity of beef and mutton in our land, concerns all classes of the community, and comes to be of deep national importance. This is the case at all times; but at present, when foreign competition is doing so much, and threatens to do more and more, to render the production of food for the people altogether unprofitable in our country, it is of the last importance that the produce of our soil should be turned to the best account.

As regards grain, it is abundantly evident that there are other countries more favoured in soil and climate which can more than compete with this country. In eastern Europe and in North America, crops can be produced in large quantities at little expense, far beyond any quantity that can be raised in Scotland, even on the best soil and under the best management. It is also found that grain produced in dry sunny climates is superior in quality to the best that can be raised in the moist climate of Scotland.

The rich prairies of America, besides the production of grain, can afford grazing for cattle almost to an unlimited extent, so that American beef threatens to swamp the trade in home produce. There is, however, one kind of crop in which no foreign country has yet been able to compete with the British isles, namely, the soft grass and greensward by which the plains, valleys, and hillsides are covered. It has often been remarked, and deserves to be repeated, that it is to the soft and steadily soaking rains, and the prolonged drippings of the November and winter moisture in Great Britain, that its inhabitants are mainly indebted for their unfailing supply of succulent vegetables and roots, but especially for their rich, soft, juicy grasses, which carpet the British isles with a lovely green unknown to any other part of the world except a few very limited areas. These

unequalled grasses and succulent roots are the cause of the superiority of British mutton over that of other countries.

It is a noteworthy circumstance that the North American continent, which is so richly abundant in many natural products, is on the whole a very unfavourable region for sheep, and for the growth of wool and mutton. For both of these they must chiefly depend upon foreigners. This is owing to the climate of North America, which is in general very dry, and also liable to extremes of heat and cold, which are ruinous to those fine and crisp grasses on which sheep delight to feed.

The writer of the present report has had the opportunity for many years of observing the working of farms with mixed stock in the Highlands of Scotland. He has read with care any remarks that he has seen written on the subject, and what gives him some degree of confidence in his undertaking is, that he has been at some pains in collecting the opinions of practical farmers well qualified to judge in such matters. The report is to be directed chiefly to moorland and rough ground not suited for cultivation. That kind of ground will be found in abundance in the counties after mentioned, to which the attention is to be specially directed. Within these bounds will be found hill and dale, moors and marshes, and rough ground of all kinds. The counties referred to are the following, and it will not be out of place to state the kind of stock kept on each of them, viz:—

	Cattle.	Sheep.
Argyll, . . . . .	60,314	993,169
Inverness, . . . . .	50,753	696,359
Perth, . . . . .	73,711	672,480
Ross, . . . . .	41,687	338,427
Sutherland, . . . . .	12,343	209,413

Before going into any minute examination of these lands, it may be proper to offer a few general remarks. It is right to remember that sheep-grazing, properly so called, does not date further back than a century throughout the Highlands generally, in various places not so far. Up to that time the number kept by each farmer was very small. They were never allowed to roam at will over the hills, but were carefully herded and penned every night, while, from the beginning of June on towards the middle of September, they were milked morning and evening to help the family dietary. Along with these a considerable number of goats was generally kept, which in every respect received similar treatment, being penned and milked as well as the sheep. There is no possibility now of ascertaining with any degree of accuracy the numbers, actual or proportional, of sheep and goats kept on the farm, but from tradition still very fresh and from pastoral songs still numerous, the latter



class seems to have been held quite of equal value with the former. Horses of small size but of the hardest constitution were also kept in considerable numbers, and during the summer months wandered not merely over the hill tenanted by their owners but over a wide range of country, the high hills being held as a common by the district. But black cattle, as they are called, formed the staple of the stock over the whole Highlands. They are still called by old people *An Nith*,\* the substance or the wealth, and the owner of what was called a large and good "fold" of cows was respected—probably envied—as much as a millionaire is among the merchants of the present day.

The young cattle were allowed scope as well as the horses, but the milch cows were the objects of constant care and of much attention.† They were not held sacred as among the Hindoos, but they were treated with great tenderness and with most considerate regard. To guard them against the evil eye and every species of witchcraft, many persons repeated a charm over them every morning as they went forth to pasture; even in the shackles with which their legs were bound when they were milked, the cross bar fastening the shackle was always made of witch elm or of rowan. In the many songs composed to them they are often mentioned in terms of endearment as strong as those applied to human beings, and the woman who combined the art of filling the pail with "rearing the calf" was held in very high esteem.

From the beginning of July to the latter end of September the milch cows with sheep and goats were always driven to the grassiest and best-sheltered spots among the hills, known as the shieling. The women and young people generally tended them in these uplands, while the grass on the strath or level portions of the farm was allowed to grow in order to afford them winter food.

Such was the system of grazing pursued in the Highlands till near the close of last century. But as farmers from the southern parts of the kingdom became by degrees acquainted with the extensive mountains and glens of the north, they readily saw that a great portion of these tracts was left absolutely waste.

\* Probably the same word as the English *Neat* and Anglo-Saxon *Nyten*.

† For their milk along with that of sheep and goats was the sheet anchor and mainstay of their provision—often their sole support. Some men still living, though all past fourscore, tell of their having been for all the summer months fed on milk alone with its various preparations—no bread or potatoes being tasted by them. When there is such an outcry about the necessity of a rich diet for the maintenance of health,—when even the lowest criminals get their liberal allowances of butcher meat,—it is striking, and ought to be instructive, actually to converse with men who year after year were for several months supported on milk diet alone. The fact that they are living to an age so rarely reached is full proof that their systems were not undermined in youth.

They clearly saw that horses and cattle could not graze on the higher and steeper places of the land—that many sheep might be reared on what was there utterly unproductive.

They further observed that the breed of sheep kept in the Highlands yielded very small profits compared with what the land was capable of rearing. That breed is still preserved in St Kilda, and, it is believed, to some small extent both in the islands of Uist and Lewis. They are small in size, seldom weighing more than 40 lbs. when full grown and in good condition. But their flesh is very delicate; their wool also is of very fine quality, though unfitted for many kinds of cloth on account of its colour, or rather variety of colours, which often include sooty brown, many shades of grey, and of pale or rather dirty white. They are sometimes termed “the five-horned sheep.” They are called “the brindle-headed sheep” (*caoirich cheann riach*), on account of their variegated colour, and “the little sheep” (*caoirich bheaga*), on account of their diminutive size; while the southern sheep are known as *caoirich mhòra*, or large sheep, divided into two sub-classes, the “black-headed sheep” (*caoirich dhùbh-cheannaeh*), and “the white,” “the English,” or “the hornless sheep,” applied to the Cheviot.

Farmers, it is said chiefly from Dumfriesshire, rented large tracts of hill ground first in Perthshire, and stocked them with what was then called “the Linton breed” of sheep, now generally called the “blackfaced.” The enterprise paid well, and was extended year after year, until by the earlier years of the present century flocks of sheep pastured the hill ranges even of the remotest Hebrides—nearly exterminating the old little breed, and driving horses and cattle to the more level pastures or strath.

Opinions differed widely as to the propriety of introducing large sheep into the Highlands. The question was fully discussed in the old Statistical Account, and it would be instructive to peruse some of the reports. The following parishes are specially referred to. In the report for Glenorchy, published in 1793, it is said:—“The hills and muirs which some years ago were covered with heath and coarse herbage are, since the introduction of large flocks of sheep into the country, gradually getting a richer sward and a greener hue, and afford excellent pasture. Everywhere they abound with springs and rivulets of pure and salubrious water. Numerous flocks of large and heavy sheep now pasture almost the whole year on these mountains and wilds, where formerly were to be found, and only for the summer months, a few light sheep and goats, small hill horses, as they were called, and some herds of black cattle. Then it was believed that no domestic animal could stand the severities of the winter on the high and stony ground; even the goats

and sheep were regularly housed and fed in pens during the rigour of the season. The consequence was often fatal. When the provender was consumed before the genial return of spring, cattle of all kinds perished in numbers for want of sustenance. There may be about 20,000 sheep in the parish. A few of the Cheviot breed have been lately introduced in Glenorchy; and the Earl of Breadalbane, ever anxious to promote the interest of his country and the good of the people, designs, it is said, to send some more of the same kind to the parish for trial. Black cattle have been for years past decreasing in number but improving in kind."

In the report for Ardochattan and Muckairn (1792) it is said:—"In the parish are from 2600 to 2800 black cattle. Though not of a large size they are in general handsome and well haired, and in great estimation with the English drovers. There are between 28,000 and 30,000 sheep. The large breed brought some years ago from the south country produce a greater quantity of wool, but are much inferior in quality to the old Highland sheep. Thousands are sold yearly to the low country butchers. When a few are purchased by individuals they sell for from 12s. to 14s.; white wool sold last year at 7s. 6d. the stone, wool besmeared with tar at 5s. 6d.—eight fleeces on an average to the stone."

"Prevailing rains through great part of the year, with a precarious seed-time and harvest, render the climate of this country unfriendly to the growth of corn; therefore, the chief attention should be directed to the improvement of our grass and cattle. The inhabitants are beginning to keep fewer cattle, and, of course, better grass than formerly. The gentlemen are particularly attentive in this respect." (See also Statistical Account, Speymouth, vol. xiv. page 383; North Knapdale, vol. vi. page 261.)

It may be interesting to quote the opinion of the Rev. Dr Singer of Dumfriesshire, as expressed in the volume containing the Society's Transactions for 1803 to 1807. Formed before he could have had it tested to any great extent by actual trial, it says a great deal for the clear and sagacious judgment of the reverend author, and I quote it as confirming the conclusion at which I have myself arrived.

He says (page 545):—"In the Highlands nature seems to have laid out extensive sheep-walks on almost every farm, and as it is found that sheep are the safest stock, the most easily and cheaply managed, having access to the largest part of the pastures, and always marketable and productive to the farmer, it is undeniable that sheep ought to be reared as the principal article of farm produce throughout the Highlands. Black cattle thrive as well as sheep to a proper extent of stocking

over all that country. Besides, it is well known that a mixture of cattle occasionally introduced into sheep pastures consume the rank grasses and render the pasture more wholesome, and no sheep in the world thrive better or become more valuable than pet sheep accustomed to feed among cows. So that the sheep gain more by this system in crops than they lose in pasture, and the farmer and the public derive great advantages from a proper number of black cattle adapted to the spare summer pasture grass which can be afforded them."

I have not thought it necessary to make any distinction between Cheviot and blackfaced sheep in the remarks which I have made, these remarks so far as they go being equally applicable to both classes. It must, however, be kept in view that blackfaced sheep will make choice of grass and herbs peculiar to hard ground and hillsides, whereas the Cheviot will use rich grass suitable for black cattle. It follows then that the blackfaced sheep are less injurious to the pasture reserved for cattle, and that it is not so necessary to exclude them as it would be to keep the whitefaced kind away.

Several years ago, when the price of wool ran very high, the price of Cheviot so far surpassed that of the blackfaced as to induce many farmers to exchange the latter for the former. Of late years, however, the difference in the price of the two kinds of wool being much reduced, the superior healthfulness and hardihood of the blackfaced is increasing their numbers, and I know various skilful farmers, with abundance of capital, who have returned to the blackfaced after having made a fair trial of the Cheviot.

Again, in speaking of cattle fitted to thrive on hill pasture, I mean West Highland cattle. Ayrshire cows are found in considerable numbers throughout every county of the Highlands. They are justly valued on account of the quantity of milk which they yield; and I have seen first crosses between them and pure Highland bulls strong and hardy. But beyond a doubt, the genuine West Highland cow of pure breed is much hardier and healthier than either pure Ayrshire or any mixture of the blood. Therefore, it need hardly be said that, if the exposed hill pastures are to be utilised by cattle, the West Highland must be employed for the purpose.

There were strong grounds of opposition taken by the small tenantry—corresponding to the present "crofters"—in that the giving over extensive hillsides to the hands of one man, who grazed large flocks of sheep on it, necessarily deprived them of their possessions, drove many of them to narrow outlying corners of the land, and very many into exile from their native home. The "big sheep" were the objects of many indignant denunciations and of many curses, as expressed in

native songs; and to this day they are heartily detested by the Highland peasantry—it must be admitted, when the many hardships of the “clearance system” are considered, not without just cause.

For a time the profits of the large flocks were considerably diminished by the ravages of wild animals, then very numerous throughout the mountains—especially the fox, which is still troublesome in many places. Far from being censured for his depredations at the introduction of the new system, his exploits were celebrated as most praiseworthy, and Duncan Ban, the most popular of all the modern Highland poets, wishes blessing on his head, and success to him in his warfare against the invaders and the disturbers of the country.

The fox and other natural enemies were, in course of time, considerably reduced in numbers and kept under restraint. Not only the hardy blackfaced sheep, but the softer Cheviots, were domesticated in the Highlands, where, as is well known, both breeds thrive remarkably well.

As already stated, sheep-farming was introduced into the Highlands by south-countrymen; but the more wealthy and intelligent of the native tenantry soon entered into competition with them; and, while the former had the advantage of previous experience and skill, as well as of saving all the expense of housekeeping, through their being frequently absentees, there is still a large extent of sheep-lands in the hands of the latter class—an extent obviously enlarging year by year for the last thirty years. In regard to the question proposed by the Society, it is worthy of remark, that generally the southerners showed a desire to clear black cattle entirely off the farm, giving the whole range to sheep, while the Highlanders, on the other hand, kept as many cattle as they could without seriously diminishing the number of their sheep. But both parties have been led by experience to modify their management in this respect, and I do not think that the above difference can be said to exist at the present day. At all events, I know several of both classes who carry on the mixed system under consideration in this report.

As to whether separate or common grazing by sheep and cattle is more profitable to the farmer, it is obvious that the question must be in several cases determined by the configuration of the land. On the higher mountains, generally rocky and precipitous, it is obvious that no heavy animal can move with safety. Such must be left to sheep alone. We put the mountains, properly so called, out of the question then in the discussion before us, confining our remarks to undulating hills not exceeding 1000 feet in height, leaving all above this to sheep exclusively.

The description of hill which we specially consider prevails to a great extent in the central districts of Argyllshire, as in Mid-Lorn; but is to be found widely prevailing in Invernessshire, Perthshire, Western Ross-shire as well. The general aspect is heathy and the ground thus designated is generally dry and hard, but frequently including considerable tracts of moss, which is wet and sour; on the other hand, stretches of land, yielding rich green grass, intermingle with these; very often small glenlets and narrow corries are to be met with up to a considerable altitude, which are partially clothed with copsewood, and produce a great variety of grasses; while, again, on the *strath*, level meadows of some extent, and marshes, always soaked in moisture, are almost invariably to be found.

Farmers may not all attend to botany as a science, but all of them know that there is great variety among the herbs and grasses produced by the lands possessed by them, and which go to feed their flocks.

On carefully examining a piece of meadow ground, the following varieties will most likely be found :—

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|---|---|
| 1. Sprits. <i>Juncus articulatus</i> .                    | 4. Bent. <i>Agrostis</i> .                              |
| 2. Soft meadow grass. <i>Holcus lanatus</i> .             | 5. Scented vernal grass. <i>Anthoxanthum odoratum</i> . |
| 3. Crested dog's-tail grass. <i>Cynosurus cristatus</i> . | 6. Fox tail. <i>Alopecurus pratensis</i> .              |
|   | 7. Meadow grass. <i>Poa pratensis</i> .                 |

On looking at a field or hillside where the soil is tolerably good there will probably be seen the following varieties :—

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|---|--|
| 1. <i>Cynosurus cristatus</i> . Crested dog's-tail.     | 7. <i>Millefolium</i> . Yarrow.                        |
| 2. <i>Lolium perenne</i> . Perennial rye-grass.         | 8. <i>Ranunculus repens</i> . Meadow crowfoot.         |
| 3. <i>Agrostis canina</i> . Fine bent.                  | 9. <i>Bellis perennis</i> . Daisy.                     |
| 4. <i>Trifolium repens</i> . White clover.              | 10. <i>Poa trivialis</i> . Rough-stalked meadow grass. |
| 5. <i>Plantago lanceolata</i> . Rib-grass, or rib-wort. | 11. <i>Avena pubescens</i> . Downy oat.                |
| 6. <i>Holcus lanatus</i> . Soft meadow grass.           | 12. <i>Aira præcox</i> . Early hair grass.             |

Higher up the hill will be found several of the grasses above named along with :—

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| <i>Aira flexuosa</i> , <i>Festuca ovina</i> , and its varieties. | <i>Molinia cærulea</i> . Purple molinia.    |
| <i>Scirpus cæspitosus</i> . Deer's hair.                         | <i>Aira cæspitosa</i> . Tufted hair grass.  |
| <i>Juncus squarrosus</i> .                                       | <i>Triodia decumbens</i> . Heath grass.     |
| <i>Carex binervis</i> . Ribbed carex.                            | <i>Calluna vulgaris</i> . Ling or heather.  |
| „ <i>præcox</i> . Vernal carex.                                  | <i>Erica cinerea</i> . Fine-leaved heath.   |
| <i>Nardus stricta</i> . Mat grass.                               | <i>Erica tetralix</i> . Cross-leaved heath. |

We thus see that soil in its natural state produces great

variety of plants or herbage, and we may safely infer that it was not all intended for one class of animals. Variety is clearly the order of nature in the animal and vegetable kingdoms, and if the farmer wishes to make use of all the produce of the soil, he will not restrict himself to one class of animals for any portion of his pasture.

Those who have the care of flocks ought to pay close attention to the localities where early grasses and plants grow, and to the succession of their growth and flowering during the season. Gardeners have their spring flowers, summer flowers, and autumn flowers. The farmer has the same succession of plants, and he will find it his interest to observe where they are to be found, and to regulate the herding of his sheep and cattle accordingly.

Where the richer grasses uniformly prevail, as on the green hills of Sutherland, there is no need of a mixed stock to utilise the pasture; and the splendid Cheviot sheep which these hills rear, are the best proof of sheep being there in the right place. But few districts are so highly favoured as Sutherlandshire, and generally the farmer has to exercise much judgment as to the most profitable method of turning to account the many, and widely different, kinds of herbage growing on his land.

It has been uniformly declared to me, by those whom I have consulted, that sheep ought to be entirely excluded from the sea shore. Various kinds of algæ, or sea-ware, are highly beneficial to cattle, and in the spring season both cattle and sheep show a strong desire to feed upon them; but to the latter they prove very injurious, and sometimes fatal. The same remark is made regarding the margins of fresh-water lakes, and marshes generally—sheep ought to have no access to them; water plants generally produce fluke and various other diseases, and they should always be kept on dry ground. With all this, however, the principal part of the farm remains still a debatable land between the two competing classes. The strath is specially the domicile of the cattle, and the hill that of the sheep. But, during the winter season, the cattle must submit to the universal intrusion of the sheep. These must be allowed the free use of the best meadow land from the beginning of December to the beginning of April and during cold backward seasons for a month longer, until the first of May. That loss to the cattle, both in pasture and in the quantity of hay on which they depend for winter sustenance, is caused by the continuance of sheep-grazing till May, is a matter of certainty; yet the gain to the sheep, in the circumstances, is greater than the loss to the cattle; for, if the ewes be driven to the hills before a good spring of grass is to be found there, the lambs are sure to be weak and stunted, while both ewes and lambs run great risk of

being carried off by the "tremor" or "trembling,"—a disease which, in the beginning of a cold dry season, often causes heavy loss to the sheep-farmer. At the same time the cattle are often benefited by visiting the sheep domains, and that without inflicting any injury on the latter.

There is a kind of coarse grass, known as stool bent, *Juncus squarrosus* (Bruchrach in Gaelic), the earliest, I believe, of all our mountain grasses, which affords favourite feeding to the deer; but sheep do not appear to relish it. Cattle are, however, very fond of it, and are known to climb considerable heights in order to get at it, in the very beginning of the month of April. Where it prevails to a considerable extent, as it very often does on the description of farm specially before us, it is true economy to send young cattle to eat it in its young and succulent state; for, once it approaches maturity, no animal will eat it. There is a plant commonly known as "deer's grass," *Scirpus caespitosus* above mentioned, much finer in the stalk than the first mentioned, which is no favourite with sheep, but which, in the months of May and June, affords excellent pasture to young cattle, and on which I have observed horses regaining condition very fast after the exhaustion of spring. Towards the middle of July it becomes dry and withered at the top; but, if kept well cropped, it yields considerable nourishment throughout autumn, and in severe winters is greedily eaten by sheep as well as by cattle. Large extents of it are found on many hills, and these will unquestionably pasture black cattle, without diminishing the supplies of the sheep; in reality, it increases them considerably. The same remarks apply to *Carex binervis*, and those of its class.

But the most important grass of any, in deciding the question, is the *Juncus articulatus* already mentioned, known in different counties as *sprots*, *sprits*, *spretts*, and *spratts*, to be found in large quantities on southern, but more especially on northern farms. It does not grow on pure mossy or on absolutely poor soil. It requires some earth to nourish it, and above all, wet soil. Unfortunately, in the undrained state of many of our straths, it is found to cover extensive tracts of level land, capable, if dried, of yielding far better product. Again, on every hillside, where there are horizontal shelves or ridges, as is almost universally the case, the streams lodge a considerable quantity of stones and gravel, which are swept down the steep runs, and rest on every shelf or partial level. The stream, instead of flowing straight downwards, spreads itself widely through this gathering of stones, and overflows a considerable extent of ground below. In this wet ground the *sprots* invariably spring up, and often flourish luxuriantly. It is impossible to state, with any approach to accuracy, what the extent of *sprotty ground* throughout the



Highland glens and hills amounts to, but it may very safely be called many thousands of acres; and I would remark that the making right use of this strong and freely growing grass, deserves more consideration than it has yet received. In the beginning of summer it is soft and juicy, and cattle eat it greedily. If it be regularly cropped by them, some finer grasses grow among it which afford good feeding for sheep; but these will not touch the sprot itself after it is two or three inches long, and by the month of July, or probably the middle of June, it becomes so strong that even black cattle are indifferent to it, and very frequently it is seen covering large patches on various parts of the farm, untouched by any animal; while in winter, it shrivels and gathers into close tufts, which, during the following spring and early summer, cover the new crop so as to protect it effectually from both sheep and cattle. If labour were as abundant and cheap in the Highlands as it was some thirty years ago, it would be good management to cut over the *sprots* with the scythe, and prepare it for winter fodder. But as this is, in the present day, attended with serious expense, it will be wise to keep down the sprots as much as possible by grazing cattle on it during the summer months.

Several of my correspondents have pointed out to me that, on the very best sheep pastures, there are knolls and shelves which the sheep select specially for night quarters. These soon become so enriched by their manure as to produce rank grass which they will not touch; but cattle greedily devour this grass, which is highly nutritious to them. There, also, cattle in numbers, larger or smaller as the circumstances may be, ought to graze along with the sheep.

The natural woods of the Highlands have in a great measure disappeared—having been cut down for manufacturing purposes.—and many a glen, at one time well sheltered and greatly adorned by birch and ash and hazel, is now left bare; but various copses or rather patches of brushwood are to be seen here and there. Sheep are very fond of visiting these, to pick up the tufts of grass which, owing to the protection and warmth afforded by the brushwood, spring up earlier than on any open ground. The brushwood tears their wool so much, “breaking the fleece” as it is called, that there is no profit in allowing them to frequent the copses except during snowstorms. But cattle enjoy the early grass as well as the sheep. They avail themselves more fully of the shelter afforded by the wood, and their coat is not in any way affected injuriously by the closest and most tangled bushes. Consequently, here is another instance where cattle should mingle with the sheep in grazing.

On looking back at the foregoing statements before bringing the paper to a close, it must be admitted that there is not

much of clear proof in support of any conclusion. Direct evidence is scarcely to be expected in such cases, but facts and circumstances ought to be considered. The writer of this had the privilege, as already mentioned, of conversing with several persons well qualified to give an opinion on the subject treated of in the report, and he would strongly recommend to inquirers to follow the same course. Travelling is now easy, by steamers and railways, and access can be got to all corners of the country, including the districts where sheep and cattle are chiefly reared. Perthshire has had the benefit of railways for many years past, and the latest of them opened, namely the Callander and Oban Railway, passes through a considerable portion of that county, and intersects Argyleshire from its eastern boundary to a seaport on the west. Last season (1880), hundreds and thousands of tourists and excursionists passed by this line, the scenery being the great attraction to most of them. Agriculturists might very well enjoy the scenery, and at the same time see for themselves the mode of management of sheep and cattle along the line. This particular railway goes through grand mountain passes, and runs along the bases of mountains on which excellent sheep stocks are kept and reared.

Travellers generally consult tourists' guides, and gather such other information as may be within their reach before setting out on a journey; and the intelligent farmer might do the same thing for his purpose. The reports for counties published from time to time by the Highland and Agricultural Society might be consulted with much advantage. That for Perthshire, published in 1868, is well worthy of a perusal. A very interesting chapter treating of sheep will be found at page 165, and a little further on in the report, but under the head "Light Arable Land," the great advantage derived from wire fences is pointed out. It will be observed, however, that this is said to apply to arable land, and not to sheep and cattle pasture. The improvement of such pastures by means of sheep drains is dwelt upon, but not a word said about the means of keeping cattle and sheep separate. It is scarcely necessary to say that cattle as well as sheep are reared in Perthshire in great numbers, and have been so from time immemorial. The annual returns by the Board of Trade show this, and a short extract will be seen at the commencement of this paper. The intelligent writer of the report for Perthshire must have been well aware that sheep and cattle were reared on the lands described by him, but it is pretty plain that he did not contemplate the keeping of the two classes separate. The owners of stock were alive to the advantage of modern improvement, such as fencing and sheep-draining; and there is a strong presumption that they did not practice or approve of complete separation of the classes.

## ON THE COMPARATIVE ADVANTAGES OF GRAZING

The traveller will see along the line sheep and cattle grazing together without restraint. He may very well take a general view in that way, either when going on his trip or returning from it, but he certainly ought to stop at some of the stations and get minute information for himself. The station at Tyndrum is at the very boundary between Perthshire and Argyleshire. On entering the latter county the agricultural report for it will be of service. It was published in 1878, and will be found in vol. x. of the Transactions. The account of sheep farms near the borders of Perthshire commences at page 11, the first mentioned being that of Auch, possessed by Mr Grieve, and a visit to it and the adjoining farm of Auchalder will amply repay the trouble. Before leaving Perthshire it may be mentioned that the late Marquis of Breadalbane, when he kept some sheep farms in his own hands, allowed his shepherds to keep cows without limiting them to one or two as generally done by other masters; and the presumption is that he did not consider that the cattle did much harm to the sheep stock. Some of the shepherds had several cows, and these were of the best breed, obtained no doubt from their noble master's stock. The grazing in the corries among the mountains agreed with them remarkably well, and the result was that some of the shepherds were enabled to take lands for themselves. These facts may be learned on the spot, and lands possessed by the former shepherds or their families may be seen before the contemplated trip is ended.

Proceeding westwards the next station is Dalmally. The scenery there is grand, and the grazing for sheep and cattle is excellent. Opposite the station, and round the end of Lochawe, the large grazing of Castles occupied by Mr Grieve will be seen. Some account of it will be found at page 14 of the report last mentioned. Mr Grieve has been very successful in rearing sheep and cattle for a long course of years on the same ground, and has never attempted to keep them separate.

The only other station before reaching the terminus is Taynuilt, Bonaw—a most interesting place in many points of view. When there, the traveller ought to make an excursion to one or two of the glens in the neighbourhood. Glenetive is the nearest, and if that is made choice of first, a halt may be made at Glenoe, which strikes off on the right-hand side of Lochetive, a few miles beyond Bonaw. Mr Campbell, the tenant, will show an excellent stock of sheep, and the few cattle that can be kept are allowed to range through the glen, and to climb up the hills as far as they choose. A former tenant had the farm of Clenamackrie along with Glenoe. He managed to keep twenty milch cows with their calves by having them wintered at Clenamackrie and summered in Glenoe. The cows and calves were sent to

that glen early in summer, and taken back before the end of autumn. The cows were well summered, and the sheep stock were very little if anything the worse, and the gain there was ten or twelve cows with their produce.

Farther up the loch is Glenkinlass, and the farm of Acharn is occupied by D. and A. McCallum, father and son. Mr D. McCallum, a most intelligent farmer, was in his younger days on Lord Breadalbane's lands in Perthshire, and can well describe the system carried on there, and can testify that no effort was made to keep cattle away from sheep ranges.

After finishing Glenetive and returning to Taynult, a trip to Glenlonon would be interesting. At the entrance into the glen is the farm of Barguillen, possessed by the widow and son of the late Mr McNaughton, who in early life was, like Mr D. McCallum, in the employment of the late Marquis of Breadalbane. He had the charge of a sheep stock, but was allowed to keep cows for himself, and he made excellent use of the privilege, so that he was able to take a good farm for himself, and left his family in a comfortable position. It may be mentioned, in passing, that the tenants who were in possession of this farm when the price of sheep rose very high about fifteen years ago, were carried away with the notion of putting all the land under sheep; and accordingly they sold off their black cattle. This was soon found to have been a grievous mistake. Any advantage to the sheep stock made up but a small proportion of the loss of the cattle. It was seen there and elsewhere, that a proper proportion of each kind of stock suited best, in such cases as are now under consideration.

Next to Barguillen are the grazing farms of Duntanachan and Barglass, mentioned at page 54 of the report for the county. The range of hills forming the south side of the glen rises to a considerable elevation, the highest being nearly 2000 feet above sea level, and snow lies pretty heavy there. The system followed during the long time the place has been in the same occupation (fully seventy years), is to keep the sheep to the hill in summer, but to allow them the use of the low grounds along with the cattle, in winter and spring; and when snow lies heavy on the hills they are allowed to pass to Barglass or the sunny side of the glen. Sheep are excellent weather prophets, insomuch as they know when a snowstorm is approaching. It is curious to observe on a dark winter day how the sheep that were grazing on the strath during the day will, towards the evening, turn their back upon their own home, and seek the lower or sheltered side of the glen, quite contrary to their ordinary habits. When this occurs a snowstorm may be expected, although no human eye could see any sign of its approach. It is said that the fibre of the wool is very sensitive to the changes of the weather, like mercury and cat-

gut, which are used for barometers. Be that as it may, it is evident that the sheep have an instinct that gives them warning of the changes of the weather, and when that instinct has been bestowed upon the poor animal for self preservation, it would be cruel and barbarous in man to put barriers in the way of its escape from danger. Those who have charge of sheep must make up their minds to allow them to have access to the most sheltered part of their lands in severe weather. Seasons come round in cycles, and we seem to have entered on a series of severe winters; and if that be so, the time is not suitable for trying experiments or modern improvements, that might imperil the safety of the very valuable stock reared and kept on our hills.

Let us now suppose that the traveller arrives at Oban, and enjoys himself as other visitors are in the habit of doing. Before leaving the place he ought to treat himself to a trip to Staffa and Iona. He will see all that attracts other visitors to these places, and besides that he will have a day's sail round the Island of Mull. That large island is wholly stocked with sheep and cattle, both of excellent description, and the intelligent and careful owners do not attempt to keep them separate, except at the proper seasons of the year.

The facts and circumstances above detailed seem to lead to the following conclusions:—

*First.*—It would not be good management to keep cattle and sheep entirely separate.

*Second.*—It would be an advantage to allow sheep during the winter and spring to pasture on the low ground usually occupied by cattle.

*Third.*—Sheep ought to be kept to the hill in summer and autumn.

*Fourth.*—A limited number of young cattle may be summered on the hill with advantage.

If these conclusions be correct, the advantage or gain is on the side of mixed grazing of sheep and cattle, with the limitations and precautions pointed out in the preceding pages.

#### APPENDIX.

Hand feeding and artificial food for sheep are often recommended, but among our Highland hills and remote glens there are many obstacles in the way. In hill farms all the hay that can be saved and the little crop that can be raised, are required, and often more than required, for cattle and horses. It must also be considered that sheep receiving extra feeding are made less hardy and less fit to be the occupants of high hills. Any stock to be reared there with advantage must be kept as hardy and healthy as possible.

Besides this, it must be remembered that high feeding changes the quality of the mutton, and such a change would soon tell in the market. Hay or Indian corn seem to be harmless, but they cannot always be procured in remote places.

It is true that sheep are fed on turnips to a very great extent; but these sheep are not to be sent back to their native hills. If they were, a poor account would have to be given of them, and the carrion crow and such creatures would have cause to rejoice.

Sheep may be reared in parks or fed on turnip, oil cake, &c., and brought to great size, but the mutton would not be the kind of mutton that has acquired its high character as the produce of the hillsides. Red deer might also be reared in parks, and increased in weight, but it would be discovered ere long, by the consumer and the butcher, that it was not venison they were getting, but very indifferent beef, not to be compared with that of a Highland bullock or heifer. Adulteration of food is a bad thing, and here is a very insidious phase of it, insomuch as those with whom it begins appear not to be conscious of doing anything amiss. A plain hint on the subject, offered in a friendly spirit, may not be entirely out of place.

#### EXPERIMENTS ON THE CULTURE OF TURNIPS.

By THOMAS LAWSON, Sandyford, Kirriemuir.

[*Premium—Twenty Sovereigns.*]

THE turnip crop occupies a primary position of importance in its relation to the agriculture of Scotland, and anything which tends to grow this important and valuable root more effectively and economically than has been hitherto done, is both eagerly and attentively inquired into by agriculturists, and never more so than at present, when foreign competition is waging war against our home agriculture, which, crippled by a sequence of bad seasons, will require all our efforts at economy to successfully cope with it. Mr Thomas Jamieson, the talented chemist and practical experimentalist of the Aberdeen Association, some years ago drew the attention of the agricultural public to the expediency of using ground instead of soluble phosphates, stating, as his belief, that the one was almost, if not altogether, as efficacious for the growth of turnips as the other, with the recommendation in favour of the former, that it was little more than half the price of the latter. Subsequent experiments, conducted by Mr Jamieson, have borne out the views he at that time enunciated. In 1878, Dr A. P. Aitken, on behalf of the Highland Society of Scotland, took up the same question as the Aberdeen Association, on a much larger scale, with the result, that the experiments in the Lothians conducted by him have tended, to a very considerable extent, to corroborate Mr Jamieson's findings in Aberdeenshire, so far as these two are

comparable. The value of the results of these two sets of experiments can scarcely be overestimated as general guides to the manuring of the turnip crop; but with variety of soils and climates, under different conditions of cropping and previous manuring, considerable variation, both of quantity and proportion of the constituents of an artificial manure, are necessary to grow full crops. Therefore, the results of the experiments to which I have alluded, are only applicable in their entirety to the immediate districts in which they have been carried out, or to similar soils under similar conditions, and are only useful otherwise, in a general way, as scientific facts. So far as I understand these experiments, their great aim has been to arrive at the facts to which I have referred, and to enable them to do so, the soil experimented on must necessarily be in as poor a condition as possible, in order to show the exact increase of crop grown by the various applications, thereby enabling the experimenter to estimate them at their proper manurial value.

This sort of work, while very necessary, is also very expensive; its performance, therefore, naturally falls into the hands of wealthy associations, being, properly speaking, scientific work which ought to be carried out by them.

It is pretty generally admitted, that any farmer who wishes to grow full crops and make profit from his holding does his best to keep his farm in a good state of cultivation. It necessarily follows that soils in a fair state of cultivation do not require quite the same manurial treatment as those poor soils to which I have referred. This class generally possesses, to some extent, every plant-food constituent necessary for the growth of the ordinary crops of the rotation; but some of the most necessary constituents may be present in very small proportion, whilst others may be in superabundance; and, as most practical farmers are aware, the bulk of a crop does not depend on the presence in the soil of a single constituent of plant-food, but in all the necessary constituents being there in proper proportion. In fact, whilst the bulk of a crop depends on all the essential ingredients being present in the right proportion, an excess of any one of them may, and very often does, prove injurious instead of beneficial to the plant. The manure applied ought to aim at supplying any deficiency of these constituents, and the one most suitable for doing so will most undoubtedly give the best and most economical results. Analyses, to a certain extent, may help the agriculturist to form an idea of the deficiencies of his soil; but they cannot always be relied on as a correct guide, and may often be misleading, as it very frequently occurs that plant-food is present in considerable quantity in the soil, and yet not in a condition to be available for being absorbed by the plant.

Thoroughly reliable results can only be got by practical tests.

in the field, and as they only apply to soils under similar conditions, as already stated, they should be repeated in every district. In 1879 I endeavoured to carry out a series of experiments on the growth of turnips with artificial manures, both with and without farmyard manure, on soil in fair condition and in ordinary rotation for the growth of the turnip crop. The results of these experiments were published in the fourth series, vol. xii., page 90, of the "Highland Society's Transactions," but, owing to the cold and abnormally wet season, they could not be looked upon as being so reliable as could have been wished; all of them, however, which were comparable, pointed in the same direction as those experiments to which I have already referred, and specially supported the efficacy of potash and nitrogen, in addition to phosphates, as fertilisers for the turnip crop. Not being satisfied with results obtained in so unfavourable a season as 1879, I, this season, resolved to make a renewed trial of the main features of my last year's experiments. I decided to confine the trial to the elucidation of the question of soluble *versus* insoluble phosphates,—both of these with potash salts added, and with potash and ammonia salts combined added. Thus, each series contained three distinct trials of soluble against insoluble phosphates, showing at the same time the increase obtained by the use of a moderate quantity of potash and ammonia salts. In order to ensure greater reliability and wider application of results, I arranged to have five stations, each station to be an exact duplicate of the others. Two of these stations were on Sandyford farm; one on the farm of Craichie, tenanted by Mr Warden; one on the farm of Migvie, tenanted by Mr Cowper; and one on the farm of Auchindorie, tenanted by Mr Soutar.

These stations have a wide radius, are at different elevations, have been cropped and manured differently during the five preceding years. They are composed of different classes of soils, and taken collectively are a fair average of a wide district, representing soil in the ordinary rotations for the growth of the turnip crop. In selecting the stations great care was taken to avoid irregularities of soil,—such as old furrows, or feerings, extra thin or deep places, old manure stances, and sheltered parts where cattle might have congregated when the field was in pasture. The size of each plot was one hundredth part of an acre, or 5 drills 13 yards long. These small plots enabled me to have the soil as nearly equal as possible, thereby allowing me fair comparison between the competing plots. On three of the stations, the plots consisted of 26 yards of 20 drills; and on the other two, 65 yards of 10 drills,—the comparative plots being in every case placed side by side.

Before speaking of the soils of the various stations, it may be of importance to state briefly, in tabulated form, the modes of



cropping observed, with kinds and quantities of manures applied during the five years prior to 1880:—

SANDYFORD I.				
Year 1875. Swedes.	Year 1876. Barley.	Year 1877. Hay.	Year 1878. Pasture.	Year 1879. Oats.
Grown with 15 tons dung and 7 cwt. mixed manure per acre.	Grown with 4 cwt. mixed manure per acre.	Grown with 1½ cwt. nitrate of soda per acre.	Fed off with cattle.	Grown with 3 cwt. 35 per cent. superphosphate, and 1 cwt. sul. of ammonia per acre.
SANDYFORD II.				
Potatoes.	Oats.	Pasture.	Pasture.	Oats.
Grown with 12 tons dung and 6 cwt. of potash and superphosphate per acre.	Grown with 15 tons town manure, and 4 cwt. 35 per cent. superphosphate, and 1 cwt. sul. of ammonia.	Fed off with cattle.	Fed off with cattle.	Grown with 3 cwt. 35 per cent. superphosphate, and 1 cwt. sulphate of ammonia.
CRAICHIE.				
Turnips.	Barley.	Hay.	Pasture.	Oats.
Grown with 12 tons dung and 5 cwt. mixed artificial manure per acre.	Grown with 3 cwt. mixed manure per acre.	—	Fed off with cattle.	Grown with 3 cwt. of guano and dissolved bones mixed per acre.
AUCHINDORIE.				
Barley.	Hay.	Pasture.	Pasture.	Oats.
Grown with 10 tons town manure after crop of potatoes with 12 tons dung per acre.	Aftermath fed off with cattle, also a quantity of turnips.	Fed off with cattle.	Fed off with cattle.	Grown without manure.

OVER MIGVIE.				
Year 1875. Turnips.	Year 1876. Barley.	Year 1877. Hay.	Year 1878. Pasture.	Year 1879. Oats.
Grown with 15 tons dung and 7 cwt. mixed manure per acre.	Grown with 4 cwt. mixed manure per acre.	Grown with 1½ cwt. nitrate of soda per acre.	Fed off with cattle.	Grown with 3 cwt. Peruvian guano and superphosphate mixed per acre.

On reference to this table, it will be observed that the five stations, with the exception of that at Auchindorie, have been cropped in the fifth rotation, the Auchindorie one being a sixth rotation or one year longer in grass. The last root crop grown on three of them was potatoes; on the other two, turnips.

I shall now give in tabulated form the nature, colour, and depth of the various soils, with their underlying geological formation, and elevation above sea-level.

Name of Station.	Elevation.	Colour of Soil.	Probable Depth.	Underlying Formation.
Sandyford I.	340 feet.	Black loam	12 to 13 inches	{ Boulder clay of Old Red Sandstone. Do.
Do. II.	330 "	Firm brown loam	10 to 12 "	
Craichie.	420 "	Sharp black soil	9 to 10 "	Trap rock.
Auchindorie,	240 "	Sharp brown soil	8 to 10 "	Porous gravel.
Over Migvie,	500 "	Good black loam	18 to 20 "	{ Boulder clay of Old Red Sandstone.

There are not two of these soils similar. The Sandyford black soil is soft and not very productive, and grows clover badly; the brown loam is firm good cropping soil; the Craichie is good sharp soil, and very productive; the Auchindorie station is very good and kindly, though not a deep soil, it does not burn readily in a dry and will not drown in a wet season, and generally carries good crops; the Over Migvie station is by far the best

soil of the five, combining depth with firmness and fertility, but is a little handicapped by its elevation above sea-level.

All the stations have a southern exposure, with the exception of Craichie, which slopes gently to the north.

The oat stubbles on all the stations were ploughed during the months of November and December of 1879, and were prepared last spring in the usual way for the turnip crop. The weather during the latter operation was exceptionally dry, so dry, indeed, that it necessitated a considerable amount of care in the manipulation of the soil during its preparation in order to retain sufficient moisture to secure a braird. The labouring of the plots was in every case done along with the rest of the field, and were only measured off after the drills were ridged up; the tops of these were harrowed down with a hand-rake to make them ready for the manure.

The experimental plots being sown along with the general crop of the farm, necessitated the sowing of the various stations at different times to suit the circumstances of the farm on which each was situated. The lighter sharper soils being, as a matter of prudence, sown later in the season, thus providing against the too early maturing of the crop, and increasing the chance of its being a heavier one; the deeper and heavier soils being, of course, better able to withstand the variations of the weather, were sown earlier. Besides this, considerable differences of opinion exist as to the proper time for sowing this crop. All these circumstances were considered, and the stations were selected so as to have variety of soils, as well as differences in dates of sowing, in order to see if these varied conditions influenced the results to any extent.

To make the test between the soluble and insoluble phosphates as equal as possible, I arranged to have the superphosphate manufactured from the same material as the ground phosphates; the kind of phosphate selected was "Curacoa." A sufficient quantity of this article was got to supply all the stations; it was ground to an impalpable powder; after being mixed, it was sampled and sent to two different analysts, with the following results, 87.48 per cent., and 91.14 per cent., respectively, of tribasic phosphate. A sufficient quantity of curacoa superphosphate was also got, which was carefully broken down and thoroughly mixed, also analysed in duplicate, with the following results,—one sample containing 41.12 of soluble, and 1.50 of insoluble; the other, 42.87 soluble, and 1.65 insoluble. The superphosphate was in fine dry condition.

The potash salts used were home manufactured sulphate, analysing 77 per cent. of sulphate. The nitrogen used was in

the form of sulphate of ammonia, analysing 25·12 per cent. of ammonia. Both these salts were carefully pulverized before being mixed for sowing.

I had several reasons for selecting these sources of the various manures. My reason for choosing the curacoa was its high percentage of phosphates, it being thus less likely to contain impurities than a lower class phosphate, besides being capable of being ground into an exceedingly fine powder.

In a trial of ground *versus* soluble phosphate, fineness of division is of primary importance, as it constitutes the main value of the phosphate, in regard to its immediate availability as plant-food. The superphosphate, from the same source, was used for fair comparison, both ground and soluble being almost the highest possible of their respective classes. Sulphate of potash was chosen because it suited best for mixing, besides having given me the best results in previous years. Sulphate of ammonia was used as a quick-acting source of nitrogen, and not so readily washed away in the drains as nitrate of soda; at the same time being better suited for mixing with the other ingredients, without causing any chemical change.

The weight and value per acre of the manures used are as undernoted:—

Ground Phosphate Section.					Soluble Phosphate Section.				
Plots.	Tribasic Phosphates.	Sulphate of Potash.	Nitrogen.	Cost per acre.	Plots.	Soluble Phosphates.	Sulphate of Potash.	Nitrogen.	Cost per Acre.
I.	lbs. 280	lbs. ...	lbs. ...	£ s. d. 0 19 6	I.	lbs. 280	lbs. ...	lbs. ...	£ s. d. 1 14 6
II.	280	112	...	1 9 6	II.	280	112	...	2 4 6
III.	280	112	23½	2 9 0	III.	280	112	23½	3 4 0
IV.	No	Manure	...	...	IV.	...	112	23½	1 9 6

The No. IV. plots, of both the soluble and insoluble sections, were suggested to me by Mr Jamieson of Aberdeen, too late for being tried at the Sandyford station, but were tried at the other three stations.

As soon as the soil was prepared for sowing at each of the stations, I went personally and applied the manures, and immediately afterwards they were covered up and the turnip seed sown. Aberdeen yellows were the variety sown at all the stations, unless the No. I<sup>st</sup> station at Sandyford, which was sown with swedes.

The dates of sowing and thinning on the various stations were as follows:—

Name of Station.		Sown.	Thinned.
Sandyford, . . .	Plot. I.	10th May	2d July
Do. . . . .	II.	21st May	24th June
Craichie, . . . .		1st June	30th June
Auchindorie, . .		12th June	9th July
Over Migvie, . .		24th May	22d June

The turnip plants at all the stations braired healthy and regular, unless the Sandyford swedes, and reached the thinning stage in a vigorous growing condition, untouched by fly or other parasite. The Sandyford swedes braired rather irregularly, for want of moisture, but a shower brought up a second braird about ten days after the first, and both combined gave more than a sufficient number of plants. This accounts for the late thinning at that station.

The no-manure plots had the smallest plants at thinning time on all those stations containing that plot.

The plots with phosphate, nitrogen, and potash, were best; and potash and phosphates combined, next; with phosphates alone, a little way behind these; and no-manure, of course, worst.

The difference could not be very great considering the size of the plants at this stage, and can simply be explained by stating that the best plots were on the big side for thinning, and the worst barely large enough.

On all the stations, shortly after thinning, the No. III. plots of both sections got considerably ahead of the others, the No. II. plots following hard up, with the No. I. plots still further in the rear, and no-manure, as might expected, making little progress. At this stage, comparing the soluble with the insoluble sections, there was some little difference at the various stations.

On the Sandyford and Craichie stations there appeared to be very little difference between them, whilst on the Over-Migvie and Auchindorie stations, the soluble phosphates gathered a slight lead for some weeks after thinning, but by the 1st August no difference in appearance could be detected.

The plots with potash and nitrogen combined, without phosphates, judging from appearance of shaws on 1st August, appeared second in order of merit in their section, both on the Migvie and Craichie stations, but on the Auchindorie station, this plot was very little better than no-manure,—plainly indicating a scarcity of phosphates on this station. Hence the bad results without them, and on all the stations this plot was too dark green in the foliage to be healthy, and got more unhealthy

in appearance towards maturity. The Sandyford stations were the only ones which suffered from any unusual occurrence in the weather. A very severe hailstorm passed over the district shortly after the turnips were thinned, and literally stripped the leaves of their foliage, and knocked the plants very much about; but as all the plots at these two stations got the same treatment, it could not be said that it interfered in the slightest degree with the comparative value of the plots, although I have not the least doubt but that it kept the turnips a fortnight back, and to some extent diminished the ultimate yield. All the other stations escaped this storm.

The unhealthiness I complained of last year in the dissolved manure plots was visible only at Craichie on the superphosphate plot. That plot improved a little after the beginning of August, but was never satisfactory in appearance.

I examined very particularly the appearance of all the stations during the first week of August. At that time the Migvie station showed the best appearance of a crop, the Craichie and Sandyford being in appearance about equal. The Auchindorie station, owing to the late sowing, was at this time a little way behind; but during the two or three weeks which had elapsed since the turnips had been thinned, the progress the plants had made was almost marvellous, and showed that Mr Soutar's confidence in his light sharp soil was not misplaced, or his late sowing ill judged, the turnips at this time looking full of growth and vigour.

Speaking in a comparative way, on the 1st August the stations all seemed to speak with one voice, the Migvie and Craichie stations particularly being an exact counterpart the one of the other, the difference between the appearance of the plots being quite visible, the plot without manure being at the bottom, and the others rising in succession like the steps of a stair in the order of I. II. and III. plots successively. No difference was visible between the soluble and insoluble sections at this stage.

I am sorry to say that shortly after this, or about the middle of August, "finger and toe" smote the turnips, not only on the station at Over-Migvie, but over all the field in which it was situated, and in the course of a week or two the turnips at this station were so much diseased, that they were quite unsuitable for comparison so far as weighing was concerned. It is interesting to note, however, that every plot was seized with the disease alike, as also the general crop outside the plots, which was heavily manured with farmyard manure and a heavy dressing of mixed artificial manures; thus proving conclusively, that none of the manures used are a preventive

of "finger and toe," neither are they the cause, as the no manure plot was as badly diseased as the others.

The weather was unusually dry during the latter part of August and beginning of September, and during this trying ordeal the soluble phosphates sections were the first to show a failure of plant-food, by the shrivelling of the under leaves of the turnip shaws, and by the end of October the difference in the appearance of the shaws of the soluble as compared with the insoluble sections was quite marked, the shaws of the former being pretty well down, and the latter still fresh and green.

Dr Aitken, the Highland Society's chemist, visited all the stations on 21st of October, and inspected them very carefully. He was very much struck with the appearance of the increase of crop grown by phosphates alone, more especially on the Auchindorie station. The increase grown by the use of potash surprised that gentleman on all the stations, showing much better results than he had obtained from his experiments in the Lothians.

At this time the superiority of the ground over the soluble phosphate section was quite visible on the Auchindorie and Craichie stations, also on the Sandyford swedes, the Sandyford yellows apparently showing very little difference between the two.

Having received instructions from Dr Aitken for weighing the plots, and also for sampling them for analysis, I, on the 27th and 28th of October got this work carefully and satisfactorily accomplished. The weather during the performance of this operation was very favourable; the soil also being in fine dry condition, the turnips turned out quite clean. On being lifted, their small rootlets were cut off, and the shaws separated close to the bulbs. Shaws and roots were weighed separately, and I, along with others, superintended the weighing process.

Subjoined are the results in tabulated form, calculated up to the weight per acre.

SANDYFORD SWEDISH TURNIPS.

Ground Phosphate Section.			Soluble Phosphate Section.		Increase of Crop per Acre.			
Plots.	Weight per Acre.		Weight per Acre.		Insoluble.		Soluble.	
	Roots.	Shaws.	Roots.	Shaws.	Roots.	Shaws.	Roots.	Shaws.
	cwts.	cwts.	cwts.	cwts.	cwts.	cwts.	cwts.	cwts.
I.	193·4	81·2	189·6	85·1	3·8	...	...	3·9
II.	321·1	73·5	313·3	58·0	7·8	15·5	...	...
III.	375·3	77·3	358·0	69·7	17·3	7·6	...	...

## SANDYFORD YELLOWS.

Ground Phosphate Section.			Soluble Phosphate Section.		Increase of Crop per Acre.			
Plots.	Weight per Acre.		Weight per Acre.		Insoluble.		Soluble.	
	Roots.	Shaws.	Roots.	Shaws.	Roots.	Shaws.	Roots.	Shaws.
	cwts.	cwts.	cwts.	cwts.	cwts.	cwts.	cwts.	cwts.
I.	417.8	85.1	394.6	77.3	23.2	7.8	...	...
II.	471.1	92.8	468.1	81.2	3.0	11.6	...	...
III.	549.3	104.4	560.9	96.6	...	7.8	11.6	...

## CRAICHIE YELLOWS.

I.	402.3	58.0	340.4	58.0	61.9	...	...	...
II.	526.1	73.5	402.3	54.1	123.8	19.4	...	...
III.	533.8	85.0	514.5	54.1	19.3	30.9	...	...
IV.	185.7	42.5	417.8	73.5	...	...	...	...

## AUCHINDORIE YELLOWS.

I.	429.4	77.4	371.1	50.1	58.2	27.3	...	...
II.	533.8	81.2	429.4	42.5	104.4	38.7	...	...
III.	580.3	92.8	541.0	65.7	39.3	26.1	...	...
IV.	175.4	58.0	286.1	54.1	...	...	...	...

For the purpose of conveniently comparing the average results of each station, I shall give in tabulated form the average per plot of the increase per acre of crop, grown by the use of insoluble as compared with soluble phosphates over each station separately.

Name of Station.	Average Increase.	
	Roots.	Shaws.
	cwts.	cwts.
Sandyford Swedes,	9.6	6.4
Sandyford Yellows,	4.8	9.0
Craichie,	68.3	16.7
Auchindorie,	67.3	30.7
General Average of 12 Plots aside per Plot,	37.5	15.7



Average per acre of additional weight of crop grown by the use of potash salts added to phosphates, at a cost of 10s. :—

Name of Station.	Roots.	Shaws.	Shaws.
	cwts.	cwts.	
Sandyford I., . . . .	125·7	...	Decrease 17·4
Do. II., . . . .	63·4	5·8	...
Craichie, . . . .	92·8	5·8	...
Auchindorie, . . . .	81·3	...	Decrease 1·9
General Average of 16 Plots, .	90·8	...	Decrease 1·9

Average weight per acre of crop grown by the addition of nitrogen to phosphates and potash, at a cost per acre of 19s. 6d. :—

Name of Station.	Roots.	Shaws.
	cwts.	cwts.
Sandyford I., . . . .	49·4	7·7
Do., II., . . . .	85·5	13·5
Craichie, . . . .	59·9	5·7
Auchindorie, . . . .	79·0	17·4
General Average of 8 Plots, . . .	68·5	11·1
No manure of Craichie gives . . .	185·7	42·5
Do. Auchindorie gives . . .	175·1	58·0
Average Produce, . . . .	180·4	50·2

Potash and ammonia salts combined, without phosphates, gave the following results :—

Name of Station.	Roots.	Shaws.
	cwts.	cwts.
Craichie, . . . .	417·8	73·5
Auchindorie, . . . .	286·1	54·1

These tabulated statements of the results speak for themselves; but before discussing the results of the weighing, it might be interesting to give the weights of the samples sent for analysis. Thirty turnips were selected from each plot, as nearly as possible representative of the crop grown on it. They weighed as under :—

Stations.	Ground Phosphates.			Soluble Phosphates.		
	Plot I.	Plot II.	Plot III.	Plot I.	Plot II.	Plot III.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Sandyford I.,	37½	51½	65½	38	53½	60½
Sandyford II.,	61	70½	81½	57½	72½	78½
Craichie,	63	76	84½	53½	61½	72
Auchindorie,	65½	72	87½	63½	66	85½

Glancing at the weights of the samples, it is at once apparent that they form a fair corresponding index to the weight of the crop.

In 1879, I was frequently told that the excessively wet season of that year was the cause of the bad results shown by soluble phosphates. I had personally no definite opinion on the subject, but resolved to test the drainage water for phosphoric acid, in order to learn if it was carried off in the drains, as being the most likely if not the only effect excessive rain was likely to cause. Circumstances fortunately gave me a good opportunity of doing this in an effective manner.

The leading drain selected had an infall of about twenty acres, which was all under root crop this year, and heavily dressed with farmyard and artificial manures, last year also receiving a heavy dressing of soluble manure to the grain crop.

After the manure had been applied to the root crop of this year, there was a continuous drought for several weeks, with no rain sufficient to reach the drains. At this time I sampled the water when the pipe was only discharging a tiny stripe—not more than a gallon in ten minutes. A fortnight later a deluge of rain occurred, and in consequence the drain was running full pipe, with a considerable pressure, discharging many gallons per minute. I sampled the water after the drain had run in this way for about ten hours. Another heavy rain occurred about ten days later; the water of this drain was sampled for the third time. I sent these samples of water to a chemist for examination, and received the following report:—

“The first sample you sent contained nitric acid, but in very small proportion, what might be called a trace. Of phosphoric acid it contained none, or an exceedingly small quantity. Of potash, there was what might be called a faint trace. In both of the second samples there was a large quantity of nitric acid. Of potash, however, there was only a trace, and of phosphoric acid there was either none at all, or the quantity was so small as hardly to be recognisable.”

Judging from this report, the excessive rainfall had evidently

carried off a large quantity of nitric acid and also a little potash, but of phosphoric acid it apparently had carried off none.

When it is considered that the drain in question was discharging water at the rate of many thousand gallons a day, containing a considerable quantity of nitric acid, it will at once be evident that a large quantity of this valuable article was being washed away in the drains. A little potash had also got into the drains, but the quantity seems to have been very small, and as the first sample of water (which was entirely bottom or spring water) showed a faint trace of it, it is questionable whether much or even any of the potash salts applied to the soil had been carried away,—as the soil and subsoil in their natural composition contain about .25 per cent. of potash. A very trifling percentage of this quantity, however, is in a soluble condition.

Agriculturists generally appear to think that such abnormally wet seasons as 1879 favour the action of insoluble more than soluble phosphates, and that the results of experiments with these articles in such seasons are not reliable; but, while the popular belief is that a portion of the soluble phosphates are washed into the drains by excessive rains, and that these rains favour the decomposition of ground phosphates by assisting the action of the solvents present in the soil, this season's inquiries seem to point entirely in the opposite direction. There does not appear to be any phosphoric acid carried off in the drains, although it may have been washed into the subsoil, and the results of this year's experiments with insoluble *versus* soluble phosphates, comparatively speaking, show that this hot dry season has been more favourable for the action of ground than of soluble phosphates. Comparing the present results with those obtained in 1879, we find that the excessive wet season, instead of materially assisting in the decomposition of ground phosphates, had the opposite effect. In 1879 the no-manure plot of the Sandyford experiments weighed 143 cwt. of roots, and the average this year was 180 cwts—nearly 2 tons per acre of an increase. The average increase per acre over the no-manure plot in both years, with the various applications, was as follows:—

	1879.	1880.
	cwts.	cwts.
Grown with Insoluble Phosphates, . . .	45	180
Do. Soluble do. . . .	49	143
Do. Addition of Potash to Phosphates grow a mean of . .	102	
Do. Addition of Nitrogen do. . .	109	
Do. do. Nitrogen to Phosphates and Potash, . . .		68

Phosphates, both soluble and insoluble, have given a much larger increase this season than in 1879; indeed, the great increase of crop over that year appears to be principally due to phosphates. The results of potash are 12 cwt. per acre behind those of 1879. The results of the application of nitrogen are not comparable, as the one year it was put on with phosphates alone, and the next with phosphates and potash combined. This year's weighing of the plots shows the unexpected result of 37 cwt. per acre in favour of ground phosphates. It is necessary, however, to repeat, that the phosphates used were of the highest class and capable of being ground to the finest state of division, and they certainly were better ground than those I used last year, being passed through a screen eighty holes to the inch, and as fine as the best flour.

The value of a manure depends on the rapidity and completeness with which it is capable of being absorbed and assimilated by the plant. The same manure may be ground to two states of fineness, so that the one may expose double the amount of surface to the action of solvents that the other does, and yet both be considered finely ground. The result, therefore, would be, that the more coarsely ground phosphates would require double the time to be absorbed by the plant in comparison with the other; and hence to the fineness of subdivision I attribute in a great degree the better comparative results given this year by the ground phosphates as compared with those got in 1879. On the Craichie station I had good practical proof of the correctness of this theory of fine grinding. Mr Warden manured the continuation of the drills at that station with a well-balanced mixture, containing a fair proportion of potash, nitrogen, and phosphates. The phosphates were partially soluble, but the larger proportion of them were insoluble. This manure was in a very rough state of division as compared with the manure used on the plots, and although as much potash, nitrogen, and phosphates were used as on the triple plots of the station, the result in weight of crop was little better than the produce of phosphates alone. The cause of this deficiency I ascribe partly to the rough state of division, partly to the combinations of the various constituents of the manure. At Auchindorie the general crop was grown with artificial manure, and both manure and results were similar to those at Craichie.

At Craichie the general crop was grown with 14 tons farmyard and 6 cwt. mixed artificial manure per acre. The produce of this application weighed 2 tons per acre *less* than the triple plots of the insoluble phosphate section which had no farmyard manure. At the Sandyford yellow turnip station, the triple plots and the general crop grown with 16 tons farmyard and 7 cwt. of mixed artificial manure, gave about equal weights.

The artificial manure used to the general crop at Sandyford was in a good state of division, but not nearly so fine as that used on the plots.

The swedish turnip station was the only one on which the farmyard manure was ahead of the triple plots, and here the crop was 4 or 5 tons heavier per acre. This seems to indicate that swedes require a larger supply of plant-food than the softer varieties, and, from the more extensive ramifications of their roots, are better able to obtain it. It is abundantly proved this year on all the stations, that the theory of fine grinding of phosphates constitutes a great part of their value, as well as of all insoluble manures. There is, however, another question which arises from the result of this season's inquiries, and which most materially affects the use of ground phosphates,—that is, the presence of solvents in the soil.

It is well known that soils rich in organic matter hasten the decomposition of certain forms of manure, and that lime and alkaline salts generally have a dissolving tendency; there are also several other forms of solvents present in the soil which affect insoluble manures to a greater or less degree. The only soils on the stations known as light soils are those at Craichie and Auchindorie; the one gives the result of 68, and the other of 67 cwts. per acre of an increase in favour of ground phosphate. The Sandyford station (swedes) is soft black loam, and gives a result of 9 cwt. per acre of an increase. The Sandyford yellows is firm soil, inclined to be heavy; it only gives 4 cwt. per acre in favour of insoluble phosphate. Judging from these results, it would seem as if the light sharp soils of the Auchindorie and Craichie stations contained a larger proportion of solvents in their composition than the others, or that their open porous nature, by more readily admitting the atmosphere, may have contributed in no slight degree to the oxidation and dissolving of the phosphates. The class of soils to which the other stations belong may be said to give pretty equal results with the soluble and insoluble phosphates, as a difference of a few hundred-weights per acre is hardly appreciable on a crop of turnips. The only deduction which can be drawn from this is, that light sharp soils give better results with ground phosphates than medium soils. I will not venture to go beyond the limits of my experience so far as to say that heavy clay soils will give worse results than medium soils, but will simply say I think they would be very likely to do so to a considerable extent. However, that is immaterial to this report, as these soils are cropped in a different way; besides, there is a very small breadth of them in Strathmore, or, for that matter, in Forfarshire.

In summing up the results of my last year's inquiries, I wrote as follows:—"Judging from the results of these experiments, it

is quite clear that in such a season, and on the kind of soil, &c., to which I have already referred, the most economical manure to use for the growth of a bulky crop of turnips would be ground phosphate, with the addition of sulphate of potash and a little nitrogen in convenient form, to stimulate the plant during its early stages." I did not try that combination in my last year's experiments, but tried phosphates and potash combined, also nitrogen and phosphates combined; and from the results of these, was quite satisfied that the three combined would give the best results in weight of crop. The correctness of these conclusions has been very fully proved by this year's experiments, where in every case these three constituents combined have grown the heaviest crops. And the experiments further bear out what Mr Jamieson, and latterly Dr Aitken, have been endeavouring to impress on the agricultural public for some years past—namely, that ground phosphate is both a valuable and an economical fertiliser for the growth of a turnip crop, its main value consisting not only in its source, but mainly in the fineness of its state of division. That different classes of soils give different results with any manure is well known. On the Highland and Agricultural Society's stations in the Lothians, the addition of potash for turnips makes very little difference to the ultimate yield. In Forfarshire, on a different class of soils, it gives a very substantial increase; and on the Aberdeenshire stations, a full crop cannot be grown without it.

The small increase of crop grown by the soluble over the insoluble phosphates in 1879, as previously mentioned, was generally attributed to the excessive rainfall of that season. The result this year, with a season very hot and also very dry, with the exception of several heavy thunder showers during the month of July, shows that instead of the soluble phosphates having increased, they have fallen a considerable way behind the insoluble on the light sharp soils, similar to last year's experimental plots. Further, I am quite convinced that the ground phosphates last year would at least have given as good results as the soluble, had they been as finely ground as those used this year. Even with the rougher grinding, the difference of crop last year would not pay expenses of making them soluble.

There is another important point yet to be taken up in regard to the manuring of the turnip crop, which is of vital interest to the tenant-farmer with soil in ordinary rotation of cropping—namely, that while the growth of a good turnip crop is of great importance, the crops which follow it have also to be considered. Therefore, a few remarks on the barley crop grown this year on my last year's experimental station, may not be without interest and instruction. Both shaws and roots of the turnips on the

plots were removed during the last week of October 1879, and the soil ploughed for barley the following April, along with the remainder of the field. The barley crop, including the plots, received a dressing of 2 cwts. 42 per cent. super-phosphate, 1 cwt. 77 per cent. sulphate of potash, and half a cwt. sulphate of ammonia per acre. Notwithstanding this top-dressing, before the barley plants had been three weeks above ground, the two sections without the farmyard manure last year might have been noticed miles away by their deep brown tint amidst the healthy green of the field. Although no mark was left to indicate the precise location of the plots, their appearance a week or two after brairding pointed them out as correctly and neatly as if they had been marked off. During the first week of August, I, along with several practical men, carefully inspected the crop grown on the various plots. I shall give the results we arrived at in regard to weight of crop calculated in tenths, reckoning the general crop of the field as ten-tenths.

In Section I. no-manure gave three-tenths, ground and soluble phosphates each four-tenths; dissolved bones, which were almost a failure in turnips last year, grew close on five-tenths. In Section II. all the six plots had phosphates, two of them with potash in addition; the other four with nitrogen in addition, in different combinations. On all the six plots the crop appeared to be almost equal, and did not in any case exceed six-tenths. The nitrate of soda plot of last year came away fully as vigorously to start with as any of the forms of nitrogen; and notwithstanding the excessively wet season of 1879, had a very marked effect on the succeeding barley crop. The potash salts seem to have had ultimately about as much effect on the barley crop as the nitrogen, but did not start it away quite so rapidly at first; and I am firmly of opinion that, had the two been combined and added to phosphates for the turnip crop, besides giving the best results in weight of turnips, would also have grown the heaviest crop of barley to follow.

The general crop of the field was a very heavy one, and had the advantage of the plots to this extent. It received last year a liberal dressing of artificial, besides 20 tons farmyard manure, which would probably contain 250 lbs. of nitrogen and an equal weight of potash. In addition to this dressing to the turnips, the shaws were left on the ground, whereas they were carted off the plots. And last, though not least, as affecting the barley crop, the turnips on the plots were lifted during the last week of October, while those on the general crop were lifted later in the season. It is a well-established fact in this district that where turnips and shaws are lifted early, as compared with where they are allowed to remain on the ground a few weeks later, there is almost certain to be a difference, and often a con-

siderable difference, in the growth of the succeeding barley crop in favour of the late pulling. To this latter cause I mainly attributed the deficiency of crop shown by the two experimental sections which received farmyard manure, this deficiency amounting to not less than two-tenths below the average crop of the field. The deductions to be drawn from the results of the growth of barley on the last year's turnip plots are as follows:—

Phosphates, whether ground or soluble, applied to the turnip crop also assist the following barley crop, and both apparently to an equal extent. Nitrogen applied to the turnip crop in addition to phosphates still further increases the succeeding barley crop, and, to a great extent, shows the difference at once in starting away the plants in the earlier stages of growth much faster than phosphates alone. Potash applied for the turnip crop ultimately has as good an effect on the barley crop, but does not start the plant so quickly. Each of these manures separately has an appreciable effect on the barley crop; the plain inference, therefore, is, that all three combined and applied to the preceding turnip crop would give the best results in the succeeding barley crop.

The different forms of nitrogen used ultimately gave pretty equal results, with the exception of bone-meal, which gave little if any better results than ground coprolite; a rather surprising result, seeing it contained a considerable percentage of nitrogen in combination with the phosphates.

I fully expected that the quantity of soluble manure which was applied to the barley crop would have started it on the plots, and can only explain its failure to do so on the hypothesis that plants do not take up the artificially applied food so readily or quickly as is generally supposed. This more particularly applies to quickly growing cereals. That the general crop of the field, with its heavy dressing of farmyard and artificial manures applied to the preceding turnip crop, should start away vigorously and grow a full crop of barley, was only to be expected, as the large quantity of nitrogen and potash contained in the turnip dressing, owing to their combination, would only in a very limited degree be taken up by that crop. Therefore, leaving a large residue of those constituents thoroughly incorporated with the soil, a portion of them most undoubtedly being in a suitable condition for being immediately assimilated by the succeeding crop. Comparatively speaking, therefore, results considerably in favour of farmyard manure were only to be looked for in the barley crop, and may reasonably be expected in the succeeding grass crops.

I shall now refer to the results obtained from the analysis of the samples of turnips sent to Dr Aitken.



Subjoined are these results in tabulated form, showing the percentage of dry matter and moisture contained in the samples, also the weight per acre of the dry matter, with general averages calculated from the weight of crop grown on each station.

## SANDYFORD SWEDE STATION.

Insoluble Phosphate Sections.							Soluble Phosphate Sections.						
Plots.	Dry matter per cent.	Average per station.	Moisture per cent.	Average per station.	Dry Matter per acre.	Average per acre.	Plots.	Dry Matter per cent.	Average per station.	Water per cent.	Average per station.	Dry Matter per acre.	Average per acre.
I.	11.6	...	88.4	...	22.4	...	I.	11.2	...	88.8	...	21.2	...
II.	11.7	...	88.3	...	37.5	...	II.	11.3	...	88.7	...	35.4	...
III.	11.5	11.6	88.5	88.4	43.1	34.3	III.	11.0	11.1	89.0	88.9	39.3	31.9
SANDYFORD YELLOWS.													
I.	8.9	...	91.1	...	37.1	...	I.	9.3	...	90.7	...	36.6	...
II.	9.5	...	90.5	...	44.7	...	II.	8.9	...	91.1	...	41.6	...
III.	9.6	9.3	90.4	90.7	52.7	44.6	III.	8.1	8.7	91.9	91.3	45.4	41.2
CRAICHE YELLOWS.													
I.	8.1	...	91.9	...	32.5	...	I.	8.7	...	91.3	...	29.6	...
II.	8.4	...	91.6	...	44.1	...	II.	9.3	...	90.7	...	37.3	...
III.	7.7	8.0	92.3	92.0	41.3	39.3	III.	8.6	8.8	91.4	90.6	44.2	37.0
AUCHINDORIE YELLOWS.													
I.	8.7	...	91.3	...	37.3	...	I.	8.4	...	91.6	...	30.1	...
II.	8.1	...	91.9	...	43.2	...	II.	9.1	...	90.9	...	39.0	...
III.	8.6	8.4	91.4	91.6	49.9	43.4	III.	8.4	8.6	91.6	91.0	45.4	38.1
GENERAL AVERAGE.													
...	...	9.3	...	90.7	...	40.4	...	...	9.3	...	90.7	...	37.0

Each of the analyses in the table are the results got from 30 separate turnips, in all representing a total of 720 turnips. Judging from these results, the twelve plots grown with ground

phosphates show an average per plot of 40·4 cwts. of dry matter per acre, as against 37·0 cwt. grown by the soluble phosphates, thus leaving a balance in favour of ground phosphates of 3·4 cwts. of dry matter per acre. The general average results further show, that both soluble and insoluble phosphates give each 9·3 per cent. of dry matter in the total weight of crop grown by each. The extra average of crop in favour of ground phosphates is 37·5 per acre, which at 9·3 per cent. is exactly represented by the 3·4 cwts. of dry matter. Thus, so far as moisure is concerned, the produce of soluble and insoluble phosphate averages seem to be equal.

For convenient comparison I shall tabulate the percentage of dry matter, with its weight per acre, grown by the different applications, stating the general average of each over all the stations combined.

	Insoluble Sections.		Soluble Sections.		Increase in favour of Insoluble per plot.
	Average per cent.	Average per acre	Average per cent.	Average per acre.	
		cwts.		cwts.	cwts.
Produce of Phosphates alone,	9·3	32·3	9·4	29·3	3·0
Phosphates and Potash combined,	9·4	42·3	9·6	38·3	4·0
Phosphates, Potash, and Nitrogen combined, .	9·3	46·7	9·0	43·5	3·2
	9·3	40·4	9·3	37·0	3·4

These results seem to indicate that there is very little difference in the percentage of dry matter from the produce of the insoluble phosphate section with its three separate applications. The single and triple plot are equal, and the double plot is only one-tenth of a per cent. ahead. There is a little more variation in the soluble section, the double plot again leading, soluble phosphates alone being 1 per cent. ahead of the insoluble; but the triple plot shows a rather lower percentage than the other two, although hardly so large a difference as to call for the special condemnation nitrogen receives from some experimenters as a turnip fertiliser. It shows a surplus of solids over the double plot of 5·2 cwts. per acre, which at 9 per cent. of solids is equal to about 3 tons of turnips, which cannot be called dear at 6s. 6d. per ton., being total cost of nitrogen applied. On light

soils in Forfarshire I would consider one cwt. of sulphate of ammonia a maximum dressing for turnips, and would expect on the soils I have mentioned quite as heavy a crop and one of a more solid quality from an increase of the potash and a decrease of the nitrogen used in these experiments.

I cannot conclude this report without thanking the gentlemen who have so kindly granted me the use of their soil, along with their hearty support and co-operation in the carrying out of these experiments. The results obtained will no doubt assist them in no small degree in the economical manuring of their future turnip crops, but will to an equal extent assist all the farmers in the wide district which the experiments embrace. I have also to thank the chemical committee of the Highland Society for so kindly asking their talented chemist to inspect the stations and do the analysis for the experiments. A great deal of the value which may be attached to the experiments is due to his able assistance and co-operation.

In concluding, I would strongly urge upon the farmers of central Forfarshire a very much more extensive use of potash, especially for their root crops; and in all manures applied, particularly insoluble manures, the greatest attention ought to be given to have them in the finest mechanical state of division possible, without which maximum results cannot be got.

### THE BORDER LEICESTER BREED OF SHEEP.

By DAVID ARCHIBALD, Awa Moa, Octoga, New Zealand.

[*Premium—Ten Sovereigns.*]

THIS breed of sheep is one whose history is specially interesting, both because of its development being due in rather a remarkable way to the skill of one man, and of its existence forming a striking illustration of what can be done by selection in the breeding of animals.

Hitherto it has always been admitted that it is to the well-known Bakewell that the credit of forming the type is due; and probably no claim for distinction was ever put forward on behalf of any man upon clearer grounds. There is, no doubt, mention made by Youatt of an attempt having been made before Bakewell's time to improve the sheep then native to Leicestershire; but this attempt was a comparative failure. "It is," this writer states, "commonly believed that a farmer, named Allom of Clifton, possessed a superior breed of long-woolled sheep, and that the neighbouring farmers and many

from a distance purchased rams from him, for which they paid the extravagant sum, at that time, of two and three guineas per head." Owing, however, to some cause—most likely to the absence in Allom of that force of character and extraordinary skill that were characteristic of his great successor—this effort, as has been said, fell away without producing, so far as can now be ascertained, any permanent results. But, as soon as Bakewell took the matter in hand, the lines of reform were at once well and surely laid. This eminent man, for as such he must always be spoken of by sheep-breeders, was born in the year 1725, and being the son of "a considerable farmer," was trained for an agricultural life. At Dishley, in the county of Leicester, he began his experiments in 1755. In regard to the way in which he worked there has all along been much speculation; for the very good reason that any opinion formed on the subject must be founded altogether on inference, and cannot be based on actual knowledge, Bakewell having been to the last studiously reticent as to his system, and this probably because he had very little that he really could have told. First of all, there has been much dispute as to the breed with which he began his improvements. By some it is insisted that he started by crossing the native sheep with Lincolns; others hold that there was a dash of Romney Marsh introduced; and a third opinion is, that it was exclusively with the old Leicesters that he worked. In an angry correspondence which passed between Bakewell himself and Mr Chaplin of Tathwell, Lincolnshire, published in Arthur Young's "Annals of Agriculture in 1788," the cause being that Bakewell had ventured to inspect Mr Chaplin's stock in the absence of the owner, he makes the following statement:—"I have not used any Lincolnshire rams for twenty years past. Why have you, at different times from the year 1773 to 1786, hired from this county?" To show his dislike, however, to that breed of sheep, it is told of him that when last in the county of Norfolk he ate a neck of mutton at an inn, which afforded him a bone that he considered a curiosity, and therefore kept. It was fully twice the size of that of one of his own sheep, which had 4 inches of fat on it. He made inquiries of the butcher where the sheep came from, thinking it might be a Lincoln, but it was clearly ascertained to be a true Norfolk. Writing in the "Farmers' Magazine" in 1803, the "Northumberland Farmer"—whose statements are always worthy of being considered—also speaks of there having been tups of this breed at Dishley. "At that time," he says, "Bakewell was allowed the pick of all the principal flocks of ewes in his neighbourhood at the rate of 20s. or 21s. per head; but when the price was advanced upon him to 42s. he gave up, as by that time he had possessed himself of the best ewes in that part of the kingdom.

As for tups, he also bought them wherever he could meet with the most proper for his purpose; and, indeed, I have been told that those from whom he derived the most benefit were from Lincoln." These, it will be seen, are opinions to which much importance is not to be attached, as it may be guessed that had the admission by Bakewell given any really valuable information it would not have been made, while the "Farmer's" opinion is confessedly founded on hearsay. There is, on the other hand, obtained from Parkinson, who was an intimate friend of Bakewell and a frequent visitor at Dishley, an account of what happened, which is both trustworthy in itself and explains the other statements. What Parkinson says (writing in his "Treatise on Live Stock") took place is this, that Bakewell first brought a tup from Lincolnshire at the price of 50 guineas, when the best rams in the country were selling from 10 to 15 guineas, but that he soon discovered his mistake, and shortly afterwards bought a ram from Mr Stow for about 15 guineas, and that from this sheep he raised his noted stock. This ram is afterwards identified as being one of the old Leicester kind; for Parkinson, in another part of his book, when he is again describing the Dishley sheep, says "their wool is hairy, and probably at the time I saw them they would not be more than a double cross from the old Leicester, from which he chiefly bred his flock with the sheep he bought of Mr Stow." It is therefore reasonable to suppose, as this testimony is the best that can be got, that it was his native county stock that Bakewell made the basis of his improvements. This question is, however, one of little practical moment; what it is of importance to notice is, that it was by ever watchful selection and careful in-and-in breeding that the new type of sheep was created, the fact being that, without a certain amount of close or "sib" breeding, it is impossible to form a distinct sort of sheep or any other animal, that in crossing would be at all impressive. The object that Bakewell set before himself was to work up to an animal with the greatest aptitude to fatten, and which would produce the greatest amount of mutton with the least consumption of food and the least amount of offal. With reference to size and wool he was indifferent; his great point was early maturity; and in this respect he effected so great an improvement that, whereas the old Leicesters were usually three year old before they were fit for the butcher, the new breed could be fully fed in half that time. One event that was almost necessarily coincident with the introduction of this type of sheep was the successful cultivation of turnips. Dishley was one of the first places at which this crop was drilled instead of being sown broadcast—a proof of which is that Dawson, a well-known Roxburghshire farmer, went to Mr Bakewell's farm

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as a servant, to learn how turnips were grown under the new system, returning after he had acquired this knowledge to Scotland, where, on his farm of Frogden, he sowed his first drill crop in 1763. By means of this root crop an abundant supply of food was obtained on which to keep the sheep thriving "from their birth to their death;" and with one of his great practical difficulties thus provided for, Bakewell seems to have got rid of the other difficulty in his way—the ever recurring tendency of the stock to revert to former and less desirable types—by the only way in which indeed it could have been met, the constant and consistent striving after a model, the general form of which he developed in accordance with the experience that he was continually gaining. That in-and-in breeding was much relied on to produce the desired result has already been said, and this opinion is confirmed by several reliable writers. Sir John Sebright, for example, says, in his work on improving the breeds of domestic animals, that "Mr Bakewell effected his improvements by breeding from the same family." Youatt makes a similar statement. "Bakewell did not object," he says, "to breeding from near relations, when by so doing he put together animals likely to produce progeny possessing the characteristics that he wished to obtain"; and by way of showing the great changes that can be effected by selection, he adds, referring to the flocks of Mr Buckley of Normanton Hill and Mr Burgess of Holmepierpoint, that these sheep had been purely bred from the original Dishley stock for upwards of fifty years, but that the difference between the two flocks was so great that they had the appearance of being quite distinct varieties. Culley too, who, as will afterwards be seen, was intimately associated with Bakewell, says that the latter had not crossed with any other blood than his own for upwards of twenty years; that the best stock had been produced by the nearest affinities, and that the sheep had nevertheless not decreased in size, neither had they become less hardy or more liable to disease—a statement which is perhaps in the latter part a little extravagant, but which in any case it is important to have from one who is so much heard of among Leicester breeders.

All the light that it is possible to get has now been thrown on the origin of the breed, and it may next be inquired how Bakewell brought his sheep before the farmers of his time, and what success he met in doing this. A proof of his remarkable shrewdness is found in the system upon which, from the very outset, he appears to have conducted his commercial dealings. Instead of selling the rams which he bred, he introduced the practice of letting them out only for the season. The advantages he gained by this practice are obvious: it enabled him to keep a

much larger number of rams than he required for his own use, giving him consequently greater choice in the selection of animals from which to breed. Then—and this was the more important consideration—it never allowed an animal to go out of his possession, the great advantage of which was that when he had ascertained that a sheep had proved of value to him, he had the opportunity of again using it. It also provided a larger experimental field than could have been found at Dishley; for when the tups were out on hire, their owner had constant opportunities of noticing and hearing what effect they had produced on the different stocks to which they had been put. How the letting was gone about in Bakewell's time is described by Marshall in his work on the "Midland Counties," from which it appears that the proceedings were very similar to those at other places where the practice was carried on within living memory, and where the occasion had very much the character of a small fair, the company gathering at the breeder's farm, going over the rams, which were all numbered, and then in the event of several persons wishing to bid for one particular sheep, taking a ballot as to who should have precedence, with the result, of course, that whoever was prepared to give the highest sum closed the bargain. Like many other "original men," as an old writer says, Bakewell was at first sneered at by his neighbours, who could not understand the lines on which he was working, and were surprised at his neglect of size and wool.

It was about the year 1760 that the first Dishley ram was let on hire. The man who got this sheep was Mr Wilbore of Illson-on-the-Hill, and the price paid was 17s. 6d., at which figure it is mentioned other two rams were immediately afterwards let. For twenty years the great breeder continued steadily to improve his stock, meeting little encouragement from his neighbours; for it was only in rare cases during this time that he obtained as much as two or three guineas for the use of a sheep, but apparently confident that success would ultimately come. In 1780, twenty-five years after the flock had been established, the turn of the tide came, and then all Bakewell's hopes must have been more than fulfilled. During this season he easily obtained ten guineas for some of his best rams; but this was only an indication of the rush of prosperity that was to follow. Within four years from this time the letting value of his best rams rose to one hundred guineas, and fancy prices were thereafter the rule. In 1786 a ram was let for one season for two hundred guineas, on condition that he should serve at Dishley a third of the usual number of ewes shed to one tup; and the amount realised for the whole of that year's letting was one thousand guineas. This, however, was far surpassed by the following seasons, for in 1789 twelve hundred guineas were paid

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for the use of three rams, two thousand guineas for seven others, and three thousand guineas by the Dishley Society, which had by this time been formed, for the rest of the stock. The most remarkable success was that of a favourite ram called "Two Pounder," for the use of which Mr Bakewell one year received eight hundred guineas from two breeders, while he reserved one third of the animal's services for his own ewes. In addition to this hiring of rams, ewes were received at Dishley to be put to particular sires, at charges ranging from ten to sixty guineas per score. Some six or seven years before his death, which took place in 1795, Bakewell formed a small association of breeders, which was called the Dishley Society. In the institution of this Society, which consisted of twelve members, who paid an entrance fee of ten guineas, and were pledged to secrecy, the founder has generally been supposed to have had some selfish motive. It is, however, difficult to see how a man, with the reputation which Bakewell had gained, could be in any way benefited by associating himself with other breeders in the neighbourhood. The reasonable supposition, therefore, seems to be that he was more anxious to see his new breed firmly established than for any additional personal gain; and that he intended the Society as a set off against that which the Lincolnshire breeders had already organised for the purpose of fostering their type of sheep. The rules of the Dishley Society were rather curious in their character, and as they have not been often seen in print, it may not be out of place here to quote some of the principal of them:—

- "1. No member shall hire or use a ram not belonging either to Mr Bakewell or to one of the members of the Society.
- "2. No member shall give his rams, at any season of the year, any other food than green vegetables, hay, and straw.
- "3. No member shall let more than thirty rams in any one season.
- "4. No member shall let a ram for less than ten guineas to any person, nor for less than forty guineas to any person who lets rams.
- "5. No one ram shall be let to serve the flocks of more than two persons.
- "6. No member shall let a ram to any one who lets or sells his rams at fairs or markets.
- "7. No member shall take in ewes to be served by more than one ram, at his own residence, in any one season, unless they belong to members of the Society, nor to be served by any ram he uses for his own flock, with the same exception.



- "8. Mr Bakewell engages not to let any ram for less than fifty guineas to any person residing within one hundred miles of Dishley.
- "9. No member shall let a ram to any person residing within thirty miles from Leicester, and not being a member of the Society, who shall have hired a ram of Mr Bakewell during the preceding season.
- "10. No member shall sell any ewes or rams of his own breed, to breed from, unless he sells his whole flock of sheep, except to members of the Society.
- "11. From the 1st to the 8th of June the members shall not show their rams except to one another. They shall begin their general show on the 8th of June, and continue to show their rams till the 8th of July, from that day until the 8th of September they shall not show them to any one, but shall then open their show again, and continue it until the end of the season.
- "12. On the 8th and 9th of June, although the rams may be shown, no rams shall be let or engaged to be let, nor shall the price which will be required for him be mentioned by any one.
- "13. Every member refusing or neglecting to abide by the rules of the Society, or withdrawing himself from it, shall no longer be considered a member. From that time he shall not be permitted to hire any ram or share of a ram from any of its members until readmitted into the Society at a general meeting."

Of this Society, one of the members was Bakewell's shepherd, John Breedon, the one man perhaps who was conversant with the system of management practised at Dishley, but who never communicated anything to the public.

From about the time of Bakewell's death dates the divergence of the sheep into the two district breeds, which are now known as the Leicester and the Border Leicester. The former are, no doubt, descended from the stock which, when Dishley came to be cleared out, went to the relations of the former owner, Mr Smith and Mr Honeybourne. By these gentlemen the animals were afterwards sold to Messrs Stubbins of Stone Barford, Mr Paget of Elman, and Philip Skipworth the elder. By the purchase of the last named was laid the foundation of the Aylesbury flock; and from Messrs Stubbins' sheep was descended the once celebrated stock which was in 1814 divided between the nephews of Mr Nathaniel Stubbins, Joseph and Robert Burgess, the former of whom was succeeded at Holme-pierpoint in 1834 by Mr Sanday, senior.

But it is in regard to the Border Leicester that most interest will be felt by Scotch breeders. In the development of this

animal, the men who, after Bakewell, did most service were the Culleys, Matthew and George, the sons of the proprietor of Denton, an estate of considerable extent in the county of Durham, where the two brothers started farming on their father's death. Hearing of what was being done at Dishley, Matthew went there in 1762, and George followed in 1763, and the outcome of these visits was the formation of an intimate friendship between Bakewell and George, and the introduction of Dishley rams to Denton, where they were put to cross the Teeswater breed, which, it is stated, were so heavy that they weighed from 40 to 50 lbs. a quarter. It is mentioned, however, in Arthur Young's "Annals of Agriculture," that the Culleys at no time purchased Leicester ewes, but continued hiring rams, and thus, by a long series of crossing with the Teeswater stock, succeeded in establishing them as Leicesters. Maintaining all along the valuable friendship of Bakewell, with whom George travelled repeatedly to visit different stocks, the Culleys, in 1767, took the farm of Fenton, near Wooller, some 1100 acres in extent, and subsequently they added Wark and other places to their holdings, till they were paying an annual rental of £6000. In their treatment of sheep they adhered closely to the principles adopted at Dishley, and though a breeder named Charge had previously brought the new blood into the north of England, this introduction was a failure; and the Culleys' stock has therefore come to be regarded as that through which nearly all Border Leicester stock is traced back to Bakewell. From their flock, many sheep were hired for use throughout the border districts on both sides of the Tweed. Among the first to have dealings with them was Mr Robertson of Ladykirk, who, by these and other purchases from Bakewell's disciples, including Mr Thomson of Chillingham Barns, formed a flock in 1789 that was kept together till 1830, when it was dispersed. In 1796, another flock, which, however, has not been broken up, was established by Mr Thomson, Bogend, whose first step towards improvement was the hiring of a tup from Wark for fifteen guineas; this being followed in 1797 by the purchase of 90 ewes from Mr Robertson of Ladykirk, his proprietor. For several years after this, Mr Thomson continued, in conjunction with his laird, to hire tups of Dishley blood, and among others from Mr Stone, Quorndam. The sheep that still represent this stock are now in the hands of Mr Thomson, Mungoswalls, Berwickshire.

The stock which were thus supplanted by the new type on both sides of the Tweed were the mug sheep. From what can be learned of the character of these animals, it is not surprising that the change was so readily welcomed. Speaking of them, the "Northumberland Farmer" says:—"I found them truly mugged. They were grown with wool all over their faces so

that I could scarcely see their eyes. Indeed, among all the numerous bad breeds then to be found, and which are still to be met with in various districts, I do not remember to have seen any one so completely ugly. Their wool grew down to their very toes; their loins were high and narrow; their shoulders sharp and hollow behind; their sides flat; their wool short and not at all fine." Such a mis-shapen, unprofitable animal could not of course hold its ground against the skilfully developed Leicester. During the first thirty years of this century, the new type of sheep became the universal breed in all low country farms in the district in question. These flocks were, as might be guessed, of very various degrees of purity, many men taking every pains to have them good, and others using tups from their own flock or any that they could procure at little cost. But soon after the period named, Leicesters, except for tup-breeding, disappeared from the district, being supplanted by Leicester and Cheviot crosses, which were found to be hardier, more prolific, better nurses, and to produce a quality of mutton more palatable to the consumers.

In the year 1806, after a most successful career, the Culleys retired from breeding, and sold off their stock at Eastfield, near Berwick. For the 420 sheep exposed, an average of £5, 7s. 3d., or £2253 in all, was obtained. At this sale, one of the principal purchasers was Mr Ralph Compton of Learmonth, who afterwards took a high position as a breeder, and with whose stock are connected the two outstanding flocks of the present day, those at Mertoun and Mellendean. Of these flocks, Lord Polwarth's may be ranked first in respect of the extent to which it has impressed its character on by far the greatest number of the most fashionable stocks now in the country.

As to the precise date at which it was founded there seems a little uncertainty. In Wight's "Tour on Husbandry," which was published in the year 1778, it is stated that, prior to that early period, Mr Scott of Harden, the then proprietor of Mertoun, had been aiming at the improvement of his stock. He had, it seems, first obtained sheep from Bammershire, in Northumberland; but the progeny of these animals were not found to be suitable for the high districts of Scotland, and were therefore put aside. "His next trial," Wight says, "was with Culleys' noted breed. He procured the best ewes of the breed, for which he gave 3 guineas, and 10 for the use of a ram for a single season." With this experiment, Mr Scott, according to this authority, was so successful that his rams came "to be not inferior to the sheep of Mr Bakewell." This account, as will be seen, carries back the Mertoun sheep to be contemporaneous with those at Dishley and Wark. Lord Polwarth, the present owner of the flock, who certainly deserves the thanks of breeders for the care he has

taken to secure the purity of blood, is not inclined to go further back than 1802. In that year, his Lordship states, the Mertoun flock was begun by his grandfather, Mr Hugh Scott of Harden. The first purchases made were from Mr Waddell of Mousin, Belford, Mr Burn of Millfield, and Mr Robson, and to these he soon afterwards added a number of ewes from Mr Jobson of Chillingham, Newtoun. The early rams were from the Culleys, to whom as much as 100 guineas were paid for their hire for a season; while other strains were subsequently introduced from Mr Riddell, Grahamslaw; Mr Compton of New Learmonth; Mr Marshall, Heatherslaw; Mr Dunning, Newlands; Mr Smith, Old Learmonth; and Mr Taylor, Presson. Since the flock was thus made up, no change has taken place in its constitution.

Some sheep, it is true, were afterwards taken from Mr Dunning, and from Mr Thompson, Haymount; and when Andrew Paterson went as shepherd to Mertoun in 1856, his small pack of thirteen were added to the breeding stock. These additions, however, did not interfere with the purity of the flock, as all the animals were clearly of Bakewell descent, Paterson's pack being of the Haymount breed, which in turn were descended from Compton blood through the Heatherslaw sheep. For the last twenty-four years no strange blood has been introduced, for though once or twice ewes and rams have been bought they have not been used in the flock or retained, all the rams used having been bred on the ground. If there has been one sheep more than another that has given the Mertoun stock the character that has made them so popular, it was perhaps a ram added to the flock about the year 1856. This animal was bred at Haymount, from which place he was first sold to go into Northumberland. When there, however, he was heard of at Mertoun, and soon afterwards he was bought for Lord Polwarth, in whose possession he afterwards remained, doing good service in developing individuality of type among the stock.

The Mellendean flock has not been so long in existence as Lord Polwarth's; but it, also, has a historical interest attached to it. The farm which has given its name to this stock was entered by the late Mr Thomas Stark more than forty years ago. Immediately after the lease was begun a number of sheep were purchased from Compton, and the foundation of the flock thus laid. In the development of this stock, one of the most generally interesting features is the way in which there was introduced the celebrated Wellington strain—a strain which, up to the present time, has produced some most valuable animals, as, for example, "Grand Duke," the animal that figured so well in the Highland Society's yard two years ago. By this family, the Mellendean sheep were connected with the small but rather celebrated flock, of which Mr Wilson, late of Edington Mains,

gives an interesting account in a valuable article which appeared in the "Transactions of the Highland and Agricultural Society."

Writing in 1862, Mr Wilson says, "That thirty-five years ago, and for many subsequent years, there existed a small flock of Leicesters, the property of Mr Luke Scott, formerly tenant of Easington Grange, near Belford," and then he goes on to describe the circumstances under which this flock was reared. Mr Scott, though getting the character of a steady and upright man, in the course of time got into difficulties, and had to leave his farm. This, however, did not lead to the dispersion of his flock. Clinging to it with an almost romantic attachment, he travelled with his small stock—which consisted of some twenty ewes and their progeny—from place to place, shifting from one farm to another as opportunity occurred, and thus obtaining a somewhat precarious subsistence for his sheep. So long as Mr Thomson of Chillingham Barns continued to breed, Mr Scott used only his rams, and after the retirement of this breeder, he continued for about twenty years, as Mr Wilson says, to maintain his stock, using entirely his own rams. Mr Scott, it is stated, let out on hire as many of his rams as he could, but never sold either male or female except to be slaughtered. Among the characteristics that are mentioned as belonging to his flock, which was separated by only one intermediate link from Bakewell's, were their white faces and legs. Owing to their own purity of breeding, they possessed in a remarkable degree the capability of imparting their own characteristics to every flock into which they were introduced. Mr Wilson states that "Mr Scott never had many ram-breeders as direct customers, as they objected to the comparative want of size of his sheep; but I have the best means of knowing that most of them freely availed themselves of his blood by hiring rams from those who did deal with him directly. So much was this the case, that there is probably no Leicester flock in the borders of any considerable reputation that has not this blood largely in it. The comparative want of size to which I have just referred always appeared to me to be less an inherent quality than the inevitable consequence of long continued hardships." From this little flock the Wellington strain was obtained; nor was this the only important service Mr Scott rendered, for one of the principal sources to which the improvement of the Compton flock was attributable was the introduction of rams belonging to Mr Jobson of Chillingham, who in turn is said frequently to have used sheep of Mr Scott's breeding.

After living to see his skill and enterprise widely recognised, Mr Stark died at Mellendean in 1866, but the flock is still maintained on the farm, the management having been in the hands of the shepherd, Thomas Thomson, down to

Whitsunday 1880, when he was succeeded by Andrew Paterson from Mertoun.

Besides these two flocks, there are, of course, many stocks of more or less reputation throughout what may be called the Border counties. In 1776, sheep of the Bakewell blood were introduced to East Lothian by Mr W. Brodie, then tenant of Upper Keith. By and by Mr Brodie's example was followed by others, until early in the present century the rivalry among breeders became so keen, that it led to the first show of sheep ever held in the county. A question, it is said, arose in July 1808 between the farmer at Linplum, Mr Bogue, who had purchased ewes and hired rams from the Culleys and others, and Mr Brodie, Scoughall, who had immediately before made some purchases at the Culleys' sale, as to who had the better class of sheep. The two very naturally declined to abide by one another's judgment, and the result was an agricultural gathering so great, according to the opinions of the times, that the writer, whose duty it was to describe the proceedings in "The Farmers' Magazine," could compare it to nothing less remarkable than the flight of Johnny Cope's army after the battle of Prestonpans; though in what respect there was any resemblance between the two events, he does not trouble himself to say. Whatever it was that led to this strange idea, the gathering undoubtedly was an important one, for it brought the farmers of the county, who assembled at Linplum in a large company to see the sheep examined, into contact with such an eminent breeder as Mr Matthew Culley, who, along with Mr Brodie of Upper Keith, was elected to give the award. The judgment was given in favour of Mr Brodie's rams, which were said to be "constitutionally disposed to fatten faster than the others."

Of late years, East Lothian breeders have collectively taken a higher place in the show-yard than those of any other district, though, on the other hand, the average price realised for their rams at the Edinburgh sales have always been beaten at Kelso—a fact which is probably due to this, that the East Lothian sheep seem to come out better earlier in the season than those from Roxburghshire and elsewhere, but that later in the season their rivals are then at their best. No exhibitor—no matter from what county—has ranked higher of late years in the Highland Society's yard, or met with greater success at the Edinburgh sales, than Mr Clark, Oldhamstocks. At the start Mr Clark was greatly indebted to a Polwarth ram, descended from the Haymount sheep, which was first brought from Mertoun by Mr Ainslie, Costerton, whose flock at one time was very successful. This tup he purchased at the dispersion of the Costerton flock,

and working with it among others, and with ewes that were partly of Mellendean blood, he at once stepped into a good position. Another East Lothian farmer, who has recently carried on breeding with a good deal of spirit and success, is Mr Andrew Smith, Castlemains; and two of the proprietors of the county, the Marquis of Tweeddale and Mr Balfour of Whittinghame, have also formed flocks, the representatives of which generally make a creditable appearance when shown in public. In Mid-Lothian no one has, considering the large numbers which he breeds, taken so high a position as Mr Melvin, Bonnington; while going to the Border district, it may be said that Mr Thompson, Baillieknowe, has of late years stood out very prominently, as have also Mr Torrance, Sisterpath; Mr Jack, Mersington; and Mr Nisbet, Lambden. In Northumberland, the two principal flocks have perhaps been those of the late Mr Forster, Ellingham, which was founded with cast ewes from Mellendean in 1867 and 1868, and dispersed in 1878; and of the Rev. R. W. Bosanquet, The Rock.

The north of Scotland is pretty well represented by Mr Ferguson, Kinnochtry, and Mr Purves, Thurdistoft, who began ten years ago; and from the west, good sheep have repeatedly been exhibited by Mr Wallace, Auchenbrain, notwithstanding the disadvantages of climate and soil that he has to contend against.

There is now a great difference between the English Leicester and the Border Leicester; but both, as has been shown, can be clearly connected with Bakewell's stock, there being put aside, as unsupported by any reliable evidence, the opinion that has been advanced by some, that the present character of the latter has to a large extent been formed by a Cheviot cross. The two types have, of course, been brought about principally through selection, the influences of soil and climate, as well as of taste, having no doubt tended to determine the lines on which the breeds have been developed. The relations in which the different stocks now stand to the original Bakewell type are, that the Border Leicester has alone preserved the white face and clean legs, but that the English animal more resembles the progenitors in his small and more compact body.

The latter, as is well known, is generally either blue or dun faced, and is covered with wool both about the legs and face, whereas Bakewell's sheep are repeatedly described as white-faced. In our national shows the two classes are now very properly kept distinct from one another; but it was only at a comparatively recent date that this was done. Up till 1869 the English and Scotch breeders were left to fight out their differences in the show-yard as best they could. If south country judges predominated, the preference was given to the few English

Leicesters that chanced to be on the ground; if, on the contrary, north country men had their way, the Border Leicesters were brought to the front. In the year in question, however, matters were put to rights, to the satisfaction of every one, but more especially of the Border men, whose entries that season numbered 104, as compared with 13 of the others.

A perfect Border Leicester should have the following characteristics:—The head should be of fair size; the nose—as Mr Usher, Stodrig, points out in a very complete description of the animal in an article recently published—should be slightly aquiline; the muzzle full; the nostrils wide; the ears erect; and the eye bright. The face, as well as the legs, should be covered with clean white hair, any blueness about the head being objectionable, as denoting weakness of constitution. The neck should be full, with the vein strong and well developed. The chest should be deep and broad, the breast should come well forward, and the shoulders broad. The ribs should be widely arched, the spring being, as Mr Usher says, “more remarkable for its width than its depth, showing a tendency to carry the mutton high, with belly straight, significant of small offal.” The back should be broad and well covered with mutton, giving a firm muscular touch; and the back bone should be well laid in flesh, so as not to present any hardness to the handling. The loins should be broad, the quarters lengthy and well fleshed down to the hocks; and the body thus made up, and nicely set upon flat clean legs, should be covered with fine curly wool. In his carriage the animal should move with his head well up, and should be full of life and action.

The most important events of the year to Border Leicester breeders are the Kelso and Edinburgh sales. At the former, which is often the occasion of upwards of 2000 rams being disposed of, the leading place, as has been indicated, has been taken by the Mertoun and Mellendean sheep. The former, whose special character is gaiety, but whose value as sires is proved by the mark they make wherever they are used, were first exposed at Kelso in 1852, when the average price obtained for the lot was £4, 8s. 7d. For the last twenty years, excepting 1869, when he was surpassed by Miss Stark, Lord Polwarth has uniformly topped the averages. During this period the most successful year was 1873, when the average price rose to £44, 15s. 2d., one of the lot going to Mr Clark, Oldhamstocks, for £195, the highest figure that has ever been paid for a sheep in Scotland. For the last few years the averages have usually ranged between £30 and £40. The Mellendean stock, whose strong points are their substance and wool, and whose value as sheep to breed from has also been widely recognised, were sold at Kelso in 1843. For that year the average is not given, but



the highest priced sheep was £4. At the next sale, that of 1844, however, the average is given at £4, and the highest price was £6, 6s. In 1859 the rams from this flock topped the sale, with an average of £12, 4s. 8d., and in 1869 they again, as has been said, came to the front, though averaging only £16, 9s. 4d., as compared with £34, 3s. in 1865 and £25, 15s. in 1866.

Leicester sheep in their management and their diseases do not differ much from the general park stock of the country. The tups are generally put to the ewes at the beginning of October; and during winter the breeding stock get a few turnips on grass. At the lambing season the ewes are supplied in addition to turnips, if necessary, with a little oats or some other hand feeding. The clipping takes place about the end of May; and the lambs are spained from the mothers in the middle of July.

In regard to diseases the only peculiarities of the breed are that they are perhaps a little more liable than others to inflammation of the udder, or what is known amongst breeders as "udder clap;" as well as to inflammation of the lungs, and that among tup lambs there is after spaining a greater tendency to scouring. For the treatment of inflamed udders, the best mixture is probably one of carbolic acid and oil. The weakness in the lungs is ascribed by some to the effects of long continued in-and-in breeding, and there can be little doubt that where sufficient attention is not paid to a proper development of the chest, nothing is more likely to perpetuate this bad characteristic than in-and-in breeding, though on the other hand, provided the chest be wide to begin with, a certain affinity of blood will not induce any weakness. For the prevention of the scouring, the only thing that can be recommended is the removal of the lambs to clover stubble, and the supply of some dry feeding such as oats.

The value of the Leicester sheep lies not in its own qualities, but in its importance for crossing purposes. In constitution it is a comparatively delicate animal; the ewes are bad nurses, and the mutton is too fat to bring a good price per lb. When, however, they are considered in reference to their merits for crossing, they deserve a very different character. There is, perhaps, no type of sheep that has conduced more to the prosperity of the agricultural or pastoral farmer than the Leicester. Most of the breeds of long-woolled sheep have benefited from an infusion of their blood. In the south the breed has, when used upon the Downs, produced a stock that has been found admirably suited to that part of the country. In Scotland the Border Leicester has exerted a remarkable influence, for over the whole of the better cultivated districts, nearly the entire sheep stock are either half or three parts bred,—the first, a cross between a Leicester tup and Cheviot ewes, and the second between a Leicester tup and half-bred ewes, produced by

the former cross ; while a cross between the Leicester tup and blackfaced ewes occupies a wide stretch of country in the midland and south-western counties. These crosses have, of course, increased considerably the demand both for Cheviot and blackfaced ewes and ewe lambs, and have consequently raised the prices of those stocks. Nor have their benefits been confined to these islands, they having been largely used in almost every part of the world, and particularly in the British colonies, where they have effected marked improvements upon the merinoes. In regard to the lines of their future treatment little can be suggested, except, as need scarcely be said, that the perfect type should never be lost sight of. If there be one point as to which special attention seems to be called for, it is the neck. In too many flocks there is a prevalence of faulty, weak necks ; and it should therefore be made matter of care by every breeder to see that this point be fully developed. The wool might also be improved in quality and more uniform in its covering ; while a deficiency in the thighs, which is much too common, ought to be remedied. Of one feature in the tup trade, which, seeing that these sheep are so entirely produced for crossing other breeds, constitutes the most important branch of Leicester breeding, mention may also be made. Every day complaints are heard of tups being injured by excessive feeding, and no doubt there is a good deal of ground for these, the Leicester being constitutionally disposed to fatten more readily than any other Scotch sheep, and therefore more liable to have its usefulness interfered with in this way. This is, however, a matter which buyers have in their own hands. So long as the preference is given at sales to highly fed tups, and animals, no matter how well bred and how good in character, are neglected solely because they are not burdened with fat, the breeder cannot be blamed for producing the only sheep that will find a market. It is therefore the purchaser and not the exposor who is the real offender ; and as soon as this fact is recognised, and selections are made in sale rings only for valuable breeding points, breeders will at once find it to their advantage to reduce their feeding. Provided that no constitutional defect—such as in all animals is only too ready to occur, unless the work of selection be always closely attended to—is allowed to detract from the character of the breed—and of this there surely need be no fear—it will be long before a sheep better fitted than the Leicester to realise profit to the farming community will be found.

## ON OYSTER-CULTURE IN SCOTLAND.

By W. ANDERSON SMITH, Oysterculturist, Ledaig, Argyllshire.

[*Premium—The Medium Gold Medal.*]

THE culture of the oyster has come to be included under the head of "Agriculture" in the United States, where the vast expansion of this industry has made it one of the utmost national importance. In this paper we do not propose to deal to any extent with the history, or natural history, of this prince of shellfish, but to call special attention to the exceptional facilities for this species of cultivation to be found in our well-sheltered Highland lochs, and most extensive foreshores. At the same time we will give our own experience as a guide to others, both in its successes and failures.

In the first place, it may be noted as a proof of the suitability of our waters for the growth of the oyster, that there are very few parts of the coast of the Western Highlands destitute of representatives, in a more or less scattered condition. As a rule these are not in extensive beds, but to a large extent rock oysters, affixed to rocks and stones, and in many instances covered over with a profuse growth of sea-weed. This situation renders them inaccessible to the ordinary oyster dredge, and they are only attainable by the tedious and costly process of lifting them one by one in calm weather, by means of an iron "graip" in some districts; an instrument called a hand dredge, shaped like a spoon as to the circumference, but with a net bottom, in others; or, as in the further north, a pair of pincers worked with a cord, and directed at the end of a long pole.

This absence of extensive beds, and difficulty of gathering the scattered oyster harvest, has not only prevented the extension of the trade, but, to a considerable extent, hidden the fact of their presence from the general public. The local demand, however, of many parts of the West Highlands is partly supplied by the "natives," of large size and particularly fine flavour, obtained from the neighbouring waters. These are mostly the products of low spring-tides, in which the peasants and cottars can reach the oysters that have been either driven further inshore by heavy weather, or have grown up on the rocks and stones accessible at these particular seasons. All this points to the fact that our seas are thoroughly congenial, and that only the physical constitution of our commonly rocky and stony sea bottom prevents the more frequent deposit of extensive dredgeable beds along our western coast. When the character of the bottom would lead us to hope for a more successful harvest, it is found that there, as elsewhere in the kingdom, the beds have been over-

dredged, as in Loch Ryan; or completely cleared, as in some of our small Highland and more accessible lochs. When this is done, theory has been found to be entirely at variance with resulting facts. The statement so frequently made that oysters are so prolific that no bed can be dredged so completely but that sufficient oysters will be left to replenish it, is never found to hold good in practice. Allowing that the oyster will throw from 200,000 to one million spat, the chances seem against its remaining where it is thrown; while on this point also, our own experience is against the statement that the spat are then carried away by currents to some bank in the vicinity, if not found upon and around the parent oyster. Enough that our shores are frequented all along by oysters, and that our banks have become and *remain* denuded of them, and the question is next how to replenish the one, and utilise the capabilities of the other.

In considering the difficulties attending oyster culture in Scotland, the first place must be given to the action and inaction of the Government in the matter. While professing to be anxious to give every encouragement to the efforts of the public, they somehow thwart them on every occasion by the mischievous application of such laws as there are. We do not greatly object to the fee of £60 demanded before any grant of foreshore will be made, as the Government were almost forced into this by the conduct of those who previously secured such grants, only for the purpose of keeping the public out of their neighbourhood, and obtaining such local fishery as there might be, but without making any effort to cultivate the ground. The above fee was no doubt meant as a fence to keep all but *bona-fide* cultivators from claiming grants of foreshore. In the case of extensive grants this is reasonable enough, but a distinction ought to be made between a capitalist and a practical working fisherman. We understand the French cultivators are all tenants-at-will, but their property in their stocks is secured to them. This, if properly administered without undue interference, is not an unfair arrangement, but unfortunately the greatest complaints are always made against the administration of the authority of the Woods and Forests with us, the whole idea of the department apparently being to increase immediate revenue, so long as their action will be supported by law. We do not believe that, under the present mode of administration in vogue in the department, any body of fishermen would invest labour or money on the principle of tenants-at-will, they having no confidence whatever in the *will* as ordinarily exercised.

But even more important than the injudicious action of the executive is the present state of uncertainty as to the rights of any man in the foreshores,—a deadening condition of affairs,

which paralyses the strongest men in any effort to grapple individually with the question, and which is partly owing to the narrow views of the department as to the duty of a Government. There is absolutely no possibility of obtaining any distinct declaration as to the real owners of most parts of our foreshores, as the Government and the proprietors on the one hand, and the public on the other, are standing opposed in a state of tension. Wherever and whenever the Government believe they will not be seriously opposed, they will assert their claim, but never if possible press it to a legal decision. Most proprietors are equally unwilling, single-handed, to push the question to extremity; so that at present it mostly means that the Government claim is tacitly admitted wherever a proprietor is too weak to fight, or not bold enough to rebel. The Government will guardedly sell "what rights they themselves possess"; the proprietors will sometimes knowingly exact rental for what they do not legally possess; the outside public will occasionally suddenly upset the calculations of either party whenever the interests are sufficiently important to stimulate them to try conclusions. We have more than once been turned aside from intended operations by discovering the real weakness of apparent rights; and, after a considerable experience, we have come to the conclusion that the whole matter as it stands is a hopeless muddle, that can only be attacked by a strong public body.

If the Highland and Agricultural Society can ventilate the subject, and stimulate the proprietors to combine to force the hands of the department, so that a clear declaration of ownership be made, they would do more to open the way for the utilisation of vast tracts of our cultivable seashore, than could otherwise be managed by any amount of private enterprise.

The first thing is to know who is the owner of the ground to be cultivated. We would suggest that the elucidation of this, for the benefit of all concerned, is a worthy goal for a powerful Society, in combination with the Scottish proprietary.

In the meantime, we do not believe that the heavy fee demanded will prove injurious or prohibitory to *bona fide* cultivators demanding important grants, but we do think it is high time that the poorer cultivator be considered. It is not perhaps necessary to grant leases if the Government would simply treat the unoccupied and unutilised foreshores as wilderness land; and, like an American homestead, if the man who cleared and planted any given portion of such foreshore were secured therein. It is always necessary to remember that access to such ground and any required buildings connected with the business, must be through and upon the land of the *ex adverso* proprietor; and consequently their reasonable claims of jurisdiction should be considered, so long as they did not unneces-

sarily interfere with the conduct of the undertaking. But this question has already been raised in connection with salmon and other fisheries.

The above considerations are wholly connected with foreshore cultivation, but this is not by any means to our mind the most promising department of oyster-culture. So far as our experience goes, oysters spat more freely in deep water, and their spat also comes more readily to maturity there. This is also the American experience. In deep salt water the oyster breeds more readily, and also increases more rapidly in growth; while on the foreshores the fish "fattens" better, grows a finer shell,—a sign of a more delicate fish—and is altogether more manageable, and beyond the reach of enemies. On the whole, we would look to more important and successful operations being conducted in our Scottish lochs by beds in deeper water, with plentiful spat-collectors suspended over them, and placed around them. When our own shore-beds were quite innocent of spat, the dredge brought up from some fathoms quantities of young about the size of a split pea; and this year we have dredged one stone with a dozen oysters, from a shilling to a florin in size, within a few hundred yards of our barren beds. These were evidently thrown by outside oysters.

The temperature has no doubt something to do with the spatting of oysters, but we firmly believe our western lochs are quite as warm as the Thames estuary, although we have no certain data for this. Certain it is, however, that there are far more oysters in congenial parts of the west than most people are aware of. We have taken thousands from a narrow piece of sea-bottom where the local authorities, constantly seeking them, declared none to exist. A gravelly bottom overgrown with tangle, often conceals immense numbers that the dredge could in no instance reach. Pure gravel we believe to be the best ground for oyster breeding, and a rich marl, or soft blue clay such as is common in some of our western districts, is the best feeding ground. This seems to supply the necessary lime in quantity, as well as the required nourishment. In this ground oysters may sink very deep without being choked with the soft muddy material; whereas, were they to sink at all in sand, the irritation would rapidly destroy them. We think it better, however, to lay them out on wattled hurdles, on which they will reap the advantages of the rich feeding ground without danger of being overwhelmed.

It is evident that deep-sea beds such as we advocate are beyond the reach of any but capitalists, or a combination of fishermen such as own and work the great Whitstable beds. Here we are on more certain ground, as the Government distinctly arrogate to themselves the right to allocate such stretches

of sea-bottom to individuals or companies,—despite public use and wont,—as has been recently done in the Thames estuary itself. This being the case, on every ground it is the safer and more certain course to take, for a party of fishermen to combine and plant such a sea-bed, having secured a Government grant therefor. Too much ground should in no case be granted to any one individual, unless under distinct conditions as to utilisation; but allowance should be made for a company, more especially of working partners, who would be stimulated to greater exertions when the profit was all their own.

We should like to have entered more into the question of temperature, and also that of gravity. Our data are, however, not sufficiently reliable or extensive to build any definite theories upon. The estimation of chlorine in our own lochs differs but little from the Atlantic, although there is a considerable influx of fresh water; while the figures with which we have been favoured as to other waters, arouse the suspicion that the samples have been taken from near or upon the surface, where the fresh water would be forced by an advancing tide. A fresh water oyster is much hardier, and better prepared for enduring carriage than a salt water specimen. Severe cold, too, is not injurious to a full grown oyster; but a low temperature at the time of spatting is apparently fatal. We believe the steady temperature of the deeper waters greatly favours the deposit of spat.

Various attempts have been made along our shores to start fresh beds, but these have generally ended in failure. This has partly been caused by inattention to the first rules of any "culture,"—want of care and nursing—partly from want of knowledge of the conditions of the problem. Thus we understand a large quantity of oysters were thrown down in Holy Loch, a district of sea thronged with mussels in myriads—that enemy that chokes the oyster—deep with mud which is constantly shifting, and open to the assaults of starfish and sea-urchins, those deadly enemies to the oyster, more especially when in a weak condition. Oysters have also more than once been laid down in Loch Etive unsuccessfully; but as they were taken from a neighbouring loch with scarcely any fresh water, and transferred at once to a loch remarkable for its variations of gravity and temperature, through the sudden enormous influxes of fresh water from its high and frequently snow-clad watershed, such a result was only natural and to be anticipated, without a much more careful and graduated transfer, so as to acclimatise the shellfish.

The oysters of Loch Roag, in the Long Island, have long been noted for their excellence, and at one time they were very numerous and readily procurable. A friend of the writer having

collected a large number, laid them down in a sheltered part of the loch, and extended over the bed thus formed long ropes of heather, with the heather in bunches all along, so as to act as a cultch for the oyster spat. This, in a season or so, was well covered with the young oysters; but, as no government grant had been obtained, the depositor had no security against the public, and the scheme soon fell through from want of "security of tenure."

Two years ago we took a lease of the southern shore of Loch Creran, in order thoroughly to test the possibility of creating an industry in connection with oysters among the warm western lochs. Our intention was at first to carry out the French system in its entirety; but, considering the different character of our seas, and the necessity for the utmost care in securing what spat might be thrown, against being carried away by strong currents or unexpected gales, we set about the matter with even more than French exactitude.

Having gathered what oysters could be collected in time along our own shores, so that they might not require acclimatising, we had them placed in enclosures erected at the very lowest of ebb tides, so that in no case would the oysters be uncovered, except for a few hours each fortnight. These enclosures were made by driving strong stakes into the ground in a circle, and wattling them all closely around. This formed a strong close basket upwards of six feet high all around the deposited oysters, on which it was hoped the spat would be sure to affix itself; a firm bottom of small gravel having been previously laid down, on which the oysters were laid.

The result of the first season was unsatisfactory, as no spat whatever was found upon the wattles, upon the mother oysters, or upon the gravel. The severity of the season of 1879, and the fact that scarcely any spat or young oysters had been seen among those left in the loch, led us to throw the blame on the untoward season; while the fact of the oysters having been removed to their new position in the middle of the breeding season, also led to the belief that the enclosed shellfish had not had fair play.

To counteract these possible errors, we determined to leave the oysters in the enclosures for another season; as well as make a series of new enclosures, to eliminate from the problem certain possibilities incident to those already in operation.

For this purpose we built one 40 feet in diameter, and upwards of 10 feet high, at the lowest of the tide; but as the rise of the tide at the highest in Loch Creran is 12 feet, it was still below the surface at high water. As the oysters were all covered with wattled hurdles a foot or two over them, to catch any spat that might rise with the tide, we did not consider the portion of the



time in which they were altogether under water as of much importance; but in order to test its influence on the problem we erected another further ashore, and of similar height, over which the tide at no time can flow clear. The bottom of this we dug out, so as to form a pond in which the oysters are always covered at the lowest of the ebb, in case the very short period in which the others were occasionally out of the water should have some influence on the prosperity of the spat.

All these were planted with our own fine oysters, in capital condition, and early in the season, so that they would be well settled ere the time arrived for throwing spat. They were likewise wattled so closely with bushy branches of Scotch fir, spruce fir, and larch, and tied together with long wands of hazel and rowan, that the whole formed huge enclosures of close basket-work, impervious to any but the most embryonic enemies, and through which it was a practical impossibility the young of the oyster could escape. In some of them, also, are placed a proportion of the oysters under a basket of close wicker-work; but the absence of light in this case would materially interfere, no doubt, with the procreative power of the parent oysters. In another we placed an erection of cocoanut matting, whose roughened fibres have before now proved an admirable "cultch" for the settlement of the young oyster. When we consider that in each of these large well-secured and well-placed erections thousands of oysters in fine condition, native to the waters, and sufficiently settled ere the breeding season commenced, were laid with care, the entire absence of spat is somewhat remarkable. That the spat could have been carried out by the currents and somewhat severe gales of the early part of the season does not admit of belief; and the more especially as this loch outside, no more than inside our erections, shows any sign of spat these two seasons beyond the merest sprinkling widely apart. This would be by no means a hopeful sign for our waters, were we not supported by the fact that the omnipresence of the oyster on our shores, shows that it certainly flourishes with us, while the almost universal failure of spat in the United Kingdom points to a general, and not a particular, cause for the absence of any with us. It is a well-known fact in connection with oyster culture, that in this country a good spat comes but once in many years, and considering the great fertility of the oyster, this alone can account for its comparative scarcity in districts where it can always be gathered by the hundred in good weather. Our experience has shown that the explanation of currents carrying off the spat cannot explain this failure in our case, while the fact that in each year the dredge or the "graipe" has brought to light the survival of some few young, shows that the cause of destruction must come somewhere between the

conception of the young and its attachment to a cultch. Frank Buckland has lately asserted that cold is the cause of the destruction of the spat, and this suggestion has much to be said in its favour. The oysters appear to have been in the proper "milky" state, and in all likelihood threw their spat, which, however, would have met an uncongenial temperature in our seas, even during most of the last fine spring and summer. If not cold during the day the air was cold at night, and the water was most remarkably low in temperature late into the season.

Again, our oysters may almost be called deep-sea oysters, and to a degree partake of their character; that is, they throw their spat late in the year, deep-sea oysters generally spawning in the autumn. This being the case, if they continue their habits in shallow water, they will throw their spat at a season of the year when the chances are altogether against them meeting with any kindly warmth in the shallows, which are assimilated in temperature to the air, while the deeper waters remain at a more equable temperature.

If this be certain, we would suggest that it would be more advisable to lay down our native oysters in deeper water, surrounded by fascines, and to import a different class of oysters for laying down in the shallows. The fact that the spat in Arcachon *never fails*, and that the French oysters spat early, would point to them as a class well suited for experimenting with on our extensive foreshores; but it must be said they seem to have altogether failed on the Irish coast.

But the culture of the oyster as an industry is not by any means confined to the breeding thereof, a considerable proportion of the labour and capital employed in connection with them in England being directed to their collection when in the condition of "brood." They are thus termed when of very small size, and suitable for laying down on the beds on the foreshores of Essex and other specially favoured districts, where they are grown and fattened for the London market. Similarly, the extensive beds of Beaumaris are replenished by dredging on the Irish coast, whence they were brought in order to improve in condition and flavour before being forwarded as required to the Liverpool market.

The continued steady decrease in the supply of such brood has sent the English boats and buyers all over the kingdom, and much of the brood laid down some years ago came from Scotland. This meant great injury to our coast supplies, through sweeping off the young as they were deposited; and now that several years of a failure of spat have supervened, there are no oysters growing up to take the place of the parents, that continue to be fished for local supply, as well as for occasional export. Looking to the importance of this branch of the subject,

it was necessary to consider whence a supply of "brood," or even immature oysters of a larger growth, were to be obtained, seeing our own supply, as well as that of the neighbourhood, had apparently failed for the time. We had been more than once informed that those oysters imported from America were unsuitable for our waters, and did not thrive even if they lived. Still this seemed the most likely source, and we determined to give it a fair trial.

The length of time most American oysters are on the way, and the very weak condition in which they arrive in this country, demanded more especial care in the transport. This, through the care of a friend, we managed, first with some mature Americans, and these we laid down carefully, allowing them only to drink through the barrel at first, so as to prevent too sudden a change of temperature, and too much gluttony from the rich foreshores on which they were then laid. They all survived and throve to our satisfaction. This induced a second experiment with young oysters of rather varied size, the smallest being less than a shilling. These also proved to be quite acclimatisable; and although we lost a good many thousands ultimately through a cold wind, while in a weak condition and exposed, this did not in the least affect the success of the experiment. Not only did these small oysters fatten successfully this last summer, but those laid down in the month of April had grown in six months to a remarkable degree, many having quite added half-an-inch all round to the edge or frill of their shell. Considering that they had to make up the loss caused by two months' starvation in transit, and also become accustomed to entirely novel conditions of existence, this growth seems to us a very satisfactory proof of the suitability of our waters to their constitutions. These oysters were of a superior character to the ordinary American with its coarse mussel-shaped shell, having a small, clean, hard shell, that augured well for the delicacy of the fish. In all cases it may be predicted that a fish with a coarse shell is coarse in its own character, seeing that the shell is really the "skeleton" of a shell-fish; and this holds good as a rule in practice.

The result of our experience hitherto with careful oyster culture in Scotland, may be considered therefore under two heads:—

*First*, As to artificial collection of the spat in shallow water we have been unsuccessful, apparently from the same causes—as yet unknown or only reasonably guessed at—as those affecting other portions of the United Kingdom. So that we are unable to consider ourselves otherwise than as still conducting a tentative undertaking, which may yet from southern analogy be a future success.

*Second*, The acclimatisation of young Americans as a source of supplying our exhausted Scottish beds has been thoroughly successful, and there can be no doubt that these improve vastly in plumpness, as well as in delicacy, on those of our mud flats that are fitted for their laying down.

It is unnecessary for us to enter here into details by which to show how a portion of foreshore may be best laid out for breeding or fattening purposes. This is dependent largely on local circumstances, and would also trespass far too largely on your space. Enough that we have throughout the foreshores of Scotland vast stretches of mud flats, well suited, with little cost, for laying down oyster fattening beds, by which the present dearth of good edible oysters would be greatly remedied. If the subject were taken up by our shore population with spirit, it would soon add a most important industry, at very small expenditure, to the more especially suitable industries of Scotland.

#### ON THE ECONOMICAL USE OF TURNIPS AS FOOD FOR CATTLE AND SHEEP.

By the Rev. JOHN GILLESPIE, M.A., Mouswald Manse, Dumfries.

##### *Importance of the Cultivation and Consumption of Turnips.*

THE introduction of turnip husbandry marked a new era in the history of agriculture in Scotland. Moreover, the cultivation of this root crop has been prosecuted by the farmers in North Britain with characteristic industry, enterprise, and success. The comparatively moist climate, as well as the free friable character of much of the soil, are highly favourable to its growth. This was apparent to Scotch farmers soon after the cultivation of turnips became general, and no effort has since been spared to discover the circumstances most favourable to their successful growth. On almost all points the cultivators of turnips had to feel their way; but so earnest, systematic, and persevering were the practical steps taken by farmers' clubs and individual farmers to study the circumstances most conducive to the growth of heavy crops, that a large measure of success was attained at a comparatively early period. The principal points investigated included the following:—the preliminary preparation of the soil, the best varieties of seeds, the most suitable time of sowing different kinds in different districts and altitudes so as to secure the most healthy and bulky crop, distances apart of drills, width of hoeing, kinds and quantities of manures to be applied to supplement the farmyard manure, &c. A great revolution in public sentiment in regard to all these particulars has been effected since turnips were first extensively cultivated,

but on most of them comparatively little substantial progress has been made during the last quarter of a century. Quite recently, it is true, the spirited and energetic promoters and managers of the Aberdeenshire experimental stations, and others, have been conducting investigations with the view of determining the cheapest kinds of artificial manures which may be used for the turnip crop with success, and also the most economical form in which these may be applied. Moreover, as we shall have occasion to point out by-and-by, they have drawn prominent attention to the great diversity in the intrinsic feeding qualities of roots grown in different climates, on different qualities of soil, and more especially with different kinds of supplemental manures. However, the main aim and hope of these experimentalists are not so much to produce decidedly heavier crops of turnips than have hitherto been grown, as to demonstrate how this important root crop can be raised with less outlay on artificial fertilisers than has generally been incurred.

But it appears to us that nothing like the same consideration has been given on the northern side of the Border to the very important question, how the turnip crop may be most economically and profitably consumed when once it has been successfully raised. The very plentifulness of these roots in Scotland has contributed to this state of matters. Such bulky crops have been grown that in ordinary seasons there has generally been a full supply for both cattle and sheep on most farms where turnip husbandry is practised, while in exceptional years difficulty has sometimes been experienced in getting the crop consumed in time to allow the succeeding cereal crop to be sown, and before the bulbs lost much of their nutritious qualities.

### *Value of the Turnip Crop.*

Before proceeding to discuss the question whether the turnip crop has hitherto been generally put to the most economical and profitable use in Scotland, it may serve to show the immense practical importance of the subject, and be otherwise useful in connection with the object of our paper, if we remind the reader of the great value, from every point of view, of this root crop. There are not a few extensive counties in North Britain, the success of whose agriculture directly, as well as indirectly, depends more on turnips than on any other industrial crop. This remark applies more particularly to the north-eastern, south-eastern, and south-western shires. The only considerable exceptions to this are the counties of Perth and Fife, in each of which a wide area is annually devoted to the growth of this bulb. In the triangular-shaped district lying north-east of a

line drawn from Dundee to Nairn, no less than 40 per cent. of all the acreage devoted to the production of turnips in Scotland is situated. The county of Aberdeen alone contains not much short of one hundred thousand acres of this crop, being almost one-fifth of the total area devoted to it in Scotland. In the counties of Roxburgh and Berwick there is 11 per cent., and in Dumfriesshire and Galloway 10 per cent. Thus these ten counties contain upwards of 60 per cent.,—that is, three-fifths of the acreage under this important root crop.

Other considerations besides its wide area show its value and importance. It is very costly to raise. The labour bill alone of growing an acre of such roots is a heavy one, including as it does horse work in preparing the land, carting the manure, and harrowing and grubbing the plants at various stages of their growth. To that has to be added the expense of manual labour, also at all stages. The heaviest outlay is generally incurred on the manure bill, especially when the value of the farmyard manure is estimated, as well as what is actually paid for supplemental fertilisers. It appears from a report made public at the time we write, that the average cost of manures per acre incurred in the growth of swedes by members of the Garioch (Aberdeenshire) Turnip-growing Association during the last sixteen years has been £5, 5s. Of course, some of these manures are unexhausted at the end of the season; but it must also be borne in mind that this residue is to some extent counterbalanced by what was in the land before the seed was sown. Further, there is the expense of harvesting the crop, for such of the bulbs as are consumed at the farm-steading require to have their tops cut off and be carted there. Besides, as we shall endeavour to show, it is profitable to uplift also whatever of the balance is to be consumed on the land by sheep; for, apart from the injury done by frost and the ravages of ground game, careful feeders are finding it remunerative to cut the bulbs and give them to white stock in troughs, instead of allowing them to be eaten where they grew. The aggregate outlay on these processes is thus very great. Another circumstance which enhances the value of the turnip crop, is the fact that during the winter months the stock-keeping capabilities of arable farms where mixed husbandry is pursued, are largely dependent upon this root crop, for in the cattle and sheep-feeding districts, the number of stock fed during any season is principally regulated by the measure of success with which it has been cultivated. Even the receipts of the hill farmers, who do not grow a single bulb on their holdings, are largely influenced by it; for the price which they receive for lambs, aged wethers, and cast ewes, is in no small degree dependent on the favourable prospect or otherwise of the season's turnip crop in the lowlands at the time the sales are

made. Moreover, the indirect benefit derived from the growth and consumption of this crop, is not the least valuable feature about it. Not to speak of its influence in cleaning and pulverising the soil, the rich farmyard manure made by cattle fed upon the bulbs at the farm steadings, and the consolidation of the land by the feet and its enrichment by the droppings of the sheep folded upon them, exert a highly beneficial influence upon the soil for several succeeding years. As already indicated, turnip culture is the backbone of agriculture in wide districts of Scotland. So much is this the case, that if a heavy crop of sound and nutritious bulbs is raised, and if they are consumed under favourable circumstances, it is tacitly taken for granted that the success of the following cereal and hay crops, and even of the pasture during the remainder of the rotation is so well secured, that only the occurrence of one or more bad seasons can prevent this being accomplished. Thus all classes of farmers are deeply interested in this widely-cultivated root crop. Indeed, it is not too much to say that its comparative failure throughout North Britain in 1879 was a much greater calamity, and entailed a heavier pecuniary loss to the farmers generally, than was done by the indifferent cereal crop in the lowlands, and the positively bad one, which was in many instances not reaped at all, in the uplands and upper valleys in that disastrous year.

The foregoing considerations show the value of the turnip crop since it began to be cultivated on anything like its present wide dimensions. But we venture to point out that recent events have made this root crop even more important than it was at any previous period of its history. It is the settled conviction of many of the best-informed authorities on agricultural questions, that one of the best weapons with which to contend against the extensive and increasing imports of American beef, is to make large and liberal use of the maize and other feeding stuffs our American cousins send us in ship loads, to assist in the manufacture of beef and mutton at home. Such dry concentrated food can be brought across at a cheaper rate and with less risk in that form than as beef or mutton, and our winter climate is more favourable than that of America for stock-feeding. Consequently we have advantages in bringing stock from a store or lean condition to a fat form, and placing them on the British market, which the United States and Canadian feeders do not possess. Now, our contention is, that it is the plentifulness of turnips in Scotland which makes this practicable, and indeed comparatively easy of accomplishment. We do not assert that it could not be done without roots, and with nothing but hay and similar dry food of home production; but with a plentiful supply of such a cool, moist, and healthy food as turnips, to form the basis as it were for such heating articles

as maize, cotton, and other foreign cakes, the work of producing beef and mutton can be prosecuted with much greater safety as regards the health of the animals, as well as on a much more extensive scale. Hence, it never was so important as now, that whatever may be the success with which turnips have been raised in any particular season, they should be put to the best and most economical use.

*General Practice of consuming Turnips in Scotland.*

And here the question meets us face to face, Have turnips hitherto been put to the best and most economical use in Scotland? We unhesitatingly reply in the negative, on the ground that by far too many watery bulbs have been given to both cattle and sheep in the past, though it is a gratifying and hopeful circumstance that the general practice is steadily undergoing improvement in this particular. In the early history of the turnip crop in North Britain, it was the universal practice to give cattle being prepared for the fat market an unlimited supply of bulbs, with no other food except long straw or hay—commonly the former. Young store cattle, when the crop was a plentiful one, had the same food supplied to them. This system is still pursued to a considerable extent in Aberdeenshire and some other districts, and it found its most prominent master and advocate in the person of the late Mr M'Combie of Tillyfour, whose name must always be mentioned with becoming respect as a breeder, grazier, and feeder of the best class of cattle. The only modification of this system which Mr M'Combie adopted in his later years, was to allow a limited quantity of concentrated food to the cattle for a short time before they were despatched to the fat market. He says in his "Cattle and Cattle Breeders," p. 31 :—"The method I adopt as to using cake and corn is the following :—On the different farms where I feed the cattle, I put a fourth part of their number only upon cake and corn at one time, and six weeks is about my limit of time for cake and corn, etc., paying the feeder before they are to be sent to the fat market." "For commercial cattle and for commercial purposes, two months is the utmost limit that cake and corn will pay the Aberdeenshire feeder. There can be no substitute for grass, straw, and turnips, except for a very limited period" (p. 30). He also mentions that it was his invariable practice to give his wintering cattle as many turnips as they could eat, and that his store cattle never saw cake, corn, or potatoes. We have quoted Mr M'Combie's views and practice in this way because he may be taken as a favourable representative of the once numerous but gradually diminishing class of cattle-feeders who believe in giving cattle an unlimited supply



of turnips. This means, be it understood, the consumption by each animal of from  $1\frac{1}{2}$  cwt. to 2 cwt. daily, according to its age and weight, cattle two-and-a-half years old and upwards getting through the larger quantity. When cattle are put upon a restricted allowance, the daily consumption varies from half a cwt. to not much short of  $1\frac{1}{2}$  cwt., the substitutes given along with this diminished supply being very various.

The practice of feeding sheep on nothing but turnips was for a considerable number of years all but universal in Scotland, and it still prevails more extensively than the similar method does in regard to cattle. Young store sheep folded upon turnips seldom get any dry food, except the very limited quantity of long hay or straw which they take out of the sheep-racks. The most enterprising and skilful feeders are in the habit of allowing both aged wethers and half-bred and other lambs, being pushed forward for the fat market, a pretty liberal allowance of grain and cake for several months before they are sold, but there is still a large proportion of owners who allow their sheep to subsist upon turnips alone during the whole winter. The system widely followed in the south-west of Scotland, and in other districts, of the growers of the turnips letting the consumption of their crop to sheep-feeders at so much per head per week, tends to perpetuate the practice of feeding them upon nothing but roots. Even those owners of sheep who are in favour of giving them supplemental food, are not unnaturally unwilling to defray the entire cost of doing so, while most of the farmers do not seem to realise that, on account of the enhanced manurial value of the sheep's droppings, as well as the restricted quantity of turnips which would be consumed, it would prove remunerative to them either to accept of a less rate per week for the board of the sheep, or to agree to pay a portion of the cost of the cake or other dry food allowed. In many districts where turnips are plentiful, it is customary for park ewes—Cheviots and other breeds from which half-bred lambs are reared—to be folded upon turnips during the months of February and March; in fact, from the former date they get nothing but watery bulbs until the lambing season is close at hand, when they are removed back to the pastures. The system—common in the midland and southern counties of England—of giving either feeding or breeding sheep cut hay or straw or chaff, is followed to a very limited extent, although quite recently it has also been growing in public favour, and is slowly but surely extending.

*Object of this Paper.*

Our object in this paper is two-fold. (1.) To endeavour to show that the system of feeding cattle upon an unlimited supply

of turnips, with no other accompaniment than long straw, and of giving sheep nothing but watery bulbs during the winter months, is unnatural, extravagant, and even wasteful. Our contention is, that the proper quantity of turnips to give an animal in ordinary circumstances is as nearly as can be calculated that amount which will supply its desire and its need for water, and that positive loss is incurred when any considerable quantity, more than serves this purpose, is allowed. We do not mean to say that exceptional circumstances may not arise, justifying a departure from this general rule. On the contrary, as we shall try to show towards the close, in some seasons, when, for example, the turnip crop is a very heavy one, and when, owing to the high price of stock or other causes, it might be hazardous to purchase additional animals to consume the surplus roots, it may be prudent, and even profitable, to give the stock on the farm a decidedly larger allowance of roots than should be given in ordinary circumstances. In such matters it would not be wise to carry out such a rule rigidly, as obviously discretion and judgment are necessary in modifying it according to circumstances. (2.) A further part of our object will be to discuss the best form in which to give the restricted quantity of turnips to cattle and sheep, and also the best substitutes to use in various circumstances, with the view of supplementing, by purchased food as well as by home-grown grain, etc., the fodder and roots on the farm.

To some extent our arguments will be founded on general considerations, based on the composition of turnips, and on their suitability, or rather non-suitability, for being the sole or even main food of stock. But we shall also rely on the experience and testimony of cattle and sheep feeders in all parts of the United Kingdom. In gathering materials for this paper, we have been in communication with many eminent agriculturists in the leading stock-feeding districts of Great Britain, almost literally from John o' Groat's to Land's End. We have met, on all hands, a cordial readiness to communicate any information asked, and more especially the results of personal experience in the feeding of both cattle and sheep, with turnips as the basis of the food given. This readiness has arisen alike from the expressed appreciation on the part of our correspondents, of the immense practical importance of the subject, especially in the face of the serious American competition with which the British stock-feeder has to contend, and also a willingness to communicate any information intended for the use of the Highland and Agricultural Society of Scotland. Many of our informants express their regret, that the actual results of the different modes of feeding tried by them had often not been put to a sufficiently exact test, owing to an absence of the means of applying such a

test. In such matters, weight is the only satisfactory and reliable criterion to go by. Price is no true index of the progress made by stock on any given food, as the animals may have been bought cheaply and sold when beef has increased in value, or *vice versa*. A weighing machine, powerful enough to weigh cattle, ought to be an appendage to every farm-stead of any considerable dimensions. It would prove of great value in helping the farmer to form a reliable estimate of the money value of his live stock, when, after being fed, they are ready to be disposed of to the butcher, and its presence would make it practicable for him to test the progress they are making from time to time. By such a system, stock-feeding would be reduced to a comparatively exact art, instead of being the slipshod, rule-of-thumb, half-guess-work which, it must be confessed, it unfortunately is at present. Such weigh-bridges are common on all large farms in America, and also on not a few small ones, and this is a phase of transatlantic agricultural enterprise and exactness of procedure which cannot too soon be copied by farmers in this country. Would it not be reasonable to expect landlords to bear the first cost, and charge their tenants a fair annual sum for their use?

### *Difference in the Composition of Turnips.*

In order to judge of the advisability of giving live stock a large and especially an unlimited supply of turnips, it is necessary to have a clear and correct idea of the constituent elements of a turnip. Of what, then, is one of these roots composed? As we shall find by and by, there is an immense difference in the nourishing properties possessed by this root crop, according to the variety, to the quality of the soil on which it has been grown, to the manures applied, and other circumstances. But let us take as our basis at this stage, an average swede grown on a fairly good soil. Such a bulb is found on analysis to contain about 90 per cent. of water and only 10 per cent. of solid matter. In other words, in every 100 lbs. of swedes there are 90 lbs., that is 6 stones 6 lbs. of water, and only 10 lbs. of dry matter. Thus, when a bullock consumes 2 cwt. of such roots in a day, he swallows 200 lbs., which is equivalent to 18 gallons, of water. An animal eating  $1\frac{1}{2}$  cwt. thereby drinks 150 lbs. or  $13\frac{1}{2}$  gallons of this liquid, while 1 cwt. contains 100 lbs. or 9 gallons of it. Now, let it be borne in mind that this very large quantity of liquid, which an animal getting a large allowance of turnips partakes of daily, is possessed of nothing better than the properties of ordinary water. People are met with who cling to the idea that there must be some special virtue in the water in turnips, else the small proportions

of their solid matter which is nourishing, could not do stock the amount of good which it does. But this is unquestionably an erroneous impression, for the analysis would be a very defective one, and consequently be misleading, if the liquid called in analysts' reports water, were anything different from ordinary water. In regard to this point, Mr Jamieson says, in his report to the Aberdeenshire Agricultural Association for 1877-78 (p. 24), "It may safely be said that water and fibre do not add to the nourishing value of the turnip."

Having seen that 90 per cent. of an average swede is composed of water, let us next inquire what are the constituent elements in the remaining 10 per cent.? Speaking in general terms, it may be said that not more than two-thirds of it in any case, and generally from one-tenth to one-fifth less than that proportion, is composed of nourishing feeding properties. About one-third of this 10 per cent. is what chemists call "woody fibre," in which there is no more nourishment than there is in a piece of pulped wood or in raw cotton. Only from 5 to 5½ per cent. of the whole turnip consists of flesh-forming, heat-producing, and fattening properties. We have constructed the following table to show an approximate estimate of the weight of water and other substances partaken of by cattle, according as they are each fed daily upon 2 cwt., 1½ cwt., 1 cwt., and ¾ cwt. of turnips respectively:—

*Table showing Composition of Average Swede in Daily Allowances given to Cattle.*

2 cwt.	1½ cwt.	1 cwt.	¾ cwt.	
200 lbs.	150 lbs.	100 lbs.	75 lbs.	Pure water.
12 "	9 "	6 "	4½ "	{ Flesh-forming, heat-producing, and fattening elements.
8 "	6 "	4 "	3 "	Woody fibre.
4 "	3 "	2 "	1½ "	{ Mineral ash and pectinous sub- stances similar to jelly in most kinds of fruit.
224 lbs.	168 lbs.	112 lbs.	84 lbs.	

The largest size of half-bred lambs (between Cheviot ewe and Leicester or Lincoln ram), when fed upon turnips alone, will consume about 30 lbs. or thereby daily, while secondary lambs of this class will eat upwards of 20 lbs. in twenty-four hours. Of the former quantity, 27 lbs. are pure water, about 1 lb. woody fibre, about ½ lb. mineral ash, etc., and only 1½ lb. heat-producing, fattening, and flesh-forming matter. When a sheep

consumes 20 lbs. of swedes the poor animal actually swallows 18 lbs. of water; that is, probably about one-seventh of its live weight daily of that cold liquid and only 1 lb. of nourishing food, the remaining 1 lb. being woody fibre and mineral ash, etc.

But it would be very misleading if we proceeded on the assumption that turnips generally contain only 90 per cent. of water, for many crops show when analysed as high a percentage as 92 and even 93. Farmers and feeders of live stock have long been aware that white turnips and other common varieties are decidedly more watery than the firmer and more compact swedes. But neither class has been sufficiently alive to the great diversity which is found in the composition of bulbs of the same variety grown on different kinds and qualities of soil, manured with different kinds of fertilisers, and produced under different circumstances in other respects. There is probably as much difference in the feeding qualities of turnips raised on different soils as there is known to be between grass and cereals grown on such soils. It is well known that some grass land will feed cattle rapidly fat, while grass on other soils would not lay flesh on the same animals though they should be grazed for a long lifetime upon it. Doubtless, the same holds good to a large extent with turnips. Speaking at the annual meeting of the Aberdeenshire Agricultural Association in 1879, the late Mr M'Combie of Tillyfour said, that "the difference in turnips grown on good, from those raised on inferior land is so great, that I should never think of putting feeding stock upon the turnips grown on inferior land."

Again, the kinds and quantities of manures applied have unquestionably a powerful influence in determining the composition of the turnips produced. "Fast" or quickly soluble manures, which force forward the growth of the plant, tend, to some extent, to deteriorate its quality and to lessen its feeding properties. Mr Jamieson says that one result of the Aberdeenshire experiments has been to show that, while the application of nitrogen to the turnips has considerably augmented the gross produce per acre, yet that that increase in weight has consisted principally, if not entirely, of water. He shows that a crop of 20 tons per acre, containing 93 per cent. of water, is only equal to  $11\frac{1}{2}$  tons per acre containing 88 per cent. of that liquid. Mr Lawes calls in question the correctness of the inference as to the influence of nitrogen in causing the bulbs to be so much more watery. Where "doctors differ" it would be rash presumption for the writer to hazard an opinion. But, fortunately for us, the weight of our argument is not in the smallest degree dependent on the question, as to what has principally contributed to the unusually watery character of particular bulbs.

Both parties, and indeed all analysts of experience, admit and testify that, however produced, many crops of turnips contain 92 and even 93 per cent. of water, and that the solid constituents in them are lessened in a proportionate degree. Thus, some bulbs, fairly representing large crops, contain only 7 per cent. of solid matter, while other fair specimens from different fields and differently manured, show as much as 12 per cent. of solid ingredients. Moreover, not only is there a great variation found in the percentage of solid matters found in different bulbs raised on different classes of soil, and with different manures, but whatever be the percentage of solid matter, the proportion of heat-producing, fattening, and flesh-forming matter therein is found to be considerably affected by the same influences. Thus, crops which show on analysis the same percentage of gross solids may yet differ greatly in their nourishing properties. There is a wide field open for scientific experimentalists to make more precise and reliable investigations and discoveries in this department than have yet been made; but it has been so far clearly established by many independent investigators, that, be the causes what they may to which they are to be attributed, such diversities as we have indicated do in reality exist. These are points to which most agriculturists hitherto have not been sufficiently alive. It has been too much the custom to look upon turnips simply as turnips, without realising the difference there may be between them in composition and nourishing qualities, and consequently in money value. In the meantime let us realise that there are turnips and turnips, hoping that scientific experimenters may ere long discover, for our benefit the main causes which contribute to the existing differences.

*Turnips too watery to constitute the Sole or even Main  
Food of Live Stock.*

Now, our contention is, that turnips are far too watery in their composition for it to be prudent or economical to make them the sole or even the principal food of live stock. It is true that the greater portion of the weight of an animal is made up of water (store cattle, sheep, and pigs contain water in the proportion of from 60 to 63 per cent. of their entire live weight), but this falls far short of being nine-tenths of their live weight, and therefore it may legitimately be inferred, that when, say, a sheep is supported entirely upon turnips it is swallowing an excess of water. Unerring instinct leads a dumb brute, if fed upon dry or moderately moist food, to partake of that quantity of liquid, and nothing more, which is good for it; and this,

we submit, is a powerful argument in favour of the opinion we have already advanced, that live stock should, as nearly as possible, get just as many turnips as will supply their desire for and their need of water.

This argument, drawn from a consideration of the percentage of water in the bodies of animals and from their instinct, may be supported by an examination of the composition of grass, which is the natural food of graminivorous animals. This vegetable may be regarded as embodying in something like due proportions the proper constituent elements of the food of the beasts which subsist upon it. What, then, is the percentage of water in ordinary grass in its natural fresh condition? One chemist gives the mean percentage of that liquid in eighteen species of fresh grass plants as 68, while another chemist specifies 70 as the mean percentage in no fewer than twenty-one species. If we take the larger of these estimates as the percentage of water in a fairly representative specimen of fresh grass, there remains 30 per cent. of solid dry matter. There is thus 70 per cent. of water in grass, the natural food of cattle and sheep, as compared with 90 per cent. in swedes, which are an artificially produced food, being a difference of 20 per cent. Consequently, when a bullock consumes  $1\frac{1}{2}$  cwt. of turnips it swallows 150 lbs. of water; whereas, in eating the same weight of fresh grass, it partakes of only 117 lbs., or about 3 gallons less.

However, the difference in the relative composition of turnips and grass is much more strikingly apparent when we compare the quantity of dry solid matter which each contains. Since turnips have 90 per cent. and grass 70 per cent. of water, it follows that the former has only 10 per cent. of solid matter as compared with 30 per cent. possessed by the latter. Consequently, in any given weight of each, there is contained three times the quantity of dry ingredients in the grass than there is in the bulbs. Thus, when a bullock consumes  $1\frac{1}{2}$  cwt. of swedes it secures therein less than 17 lbs. of dry food; whereas, in the same weight of average green grass, it obtains no less than 50 lbs. of such solid matter. Again, when a sheep eats 20 lbs. of turnips it gets only 2 lbs. of solid food, as compared with 6 lbs. which it would derive from a similar weight of ordinary pasture grass. If a closer examination is made of the different ingredients in the dry matter of turnips and grass respectively, our position will be still further illustrated and supported. We have seen that in 100 lbs. of the former vegetable only from 5 lbs. to  $5\frac{1}{2}$  lbs. are nourishing, the remainder being woody fibre and mineral ash. Cocksfoot may be taken as a representative grass, seeing Mr Way found the percentage of water in it to be about an average, viz. 70. The remaining 30 per cent. he accounted for as follows:—flesh-forming 4.06 per cent., fatty

matters 0·94 per cent., heat-producing 13·30 per cent., woody fibre 10·11 per cent., and mineral ash 1·59 per cent. Thus, when the three nourishing constituents are summed up they show 18·30 per cent. of the whole, as compared with only from 5 to 5½ per cent. in the case of turnips. Consequently, there is exactly three-and-a-half times as much nourishing matter in any given quantity of the above variety of grass as there is in the same weight of swedes.

Now, in looking to the composition of grass as affording a criterion by which to judge of the expediency of using turnips as the sole or main article of food for cattle and sheep, we must not restrict ourselves to a comparison of the proportion of nourishing food in each or of the percentage of moisture in each, but we must ascertain how much water has to be partaken of in the case of each variety of food in order to secure a given weight of dry solid food. If any animal is to make satisfactory progress towards maturity, and, indeed, even if it is to maintain itself in life, it must consume a certain weight of heat-producing and flesh-forming food. Let us assume that a given animal requires daily for this purpose 8 lbs. of such solid food. To obtain this, in the form of grass, it has to imbibe only 31 lbs. of water; whereas, to secure it with turnips as its sole food, it has to take into its stomach no less than 135 lbs. of that cold liquid. Again, when a sheep eats 20 lbs. of turnips, 18 lbs. of its food is moisture and only 1 lb. nourishing food; but to get the same amount of solid nourishment in grass, it has only to imbibe 4 lbs. of water. But if this holds good with swedes, whose analysis shows 10 per cent. of solid matter in their composition, what are we to say of the wide area of roots grown with fast manures on inferior land, which contain not more than 7 or 8 per cent. of dry substance? It is well known that when there is a lengthened track of mild moist weather, there springs up, even on pasture land where the soil is naturally good, a soft watery herbage which lacks in a large measure the rich fattening qualities which grass on the same field is possessed of in ordinary warm dry weather. This illustrates how the presence of an excessive quantity of moisture deteriorates the feeding properties of what is otherwise good and nourishing. When the matter is closely looked at in this light, no one need be surprised that so many crops of turnips have enough to do to keep animals in life and fail to add to their flesh and fat. Dean Ramsay tells about a minister's man who flattered himself that if he could not, as the result of his long association with his master, preach a sermon, he could at least draw an inference. "And what inference," he was asked, "would you draw from this text:—'A wild ass snuffeth up the wind at her pleasure?'" "I wad draw this inference," was John's quaint reply, "he wad



snuff a lang time afore he would fatten upon't." Much the same might be said of many crops of watery innutritious turnips, on which stock are attempted to be fed without a sufficient supplement of dry and concentrated food.

But it may be asked, What harm can arise from giving livestock even a superabundant supply of such a harmless liquid as water? We reply that, to compel an animal *volens volens* to take in this way far more water than it either desires or needs, not only does no good, but that it does positive harm. And here let it be borne in mind that the moisture in turnips in their natural state is at a very low temperature, and that a large and hearty meal of cold roots by themselves must reduce the temperature of the body of the animal partaking of them, and even produce a positive chill upon it. At the time when it was customary to give cattle an unlimited supply of them, it was no uncommon sight on a cold winter day to see bullocks standing literally shivering after they had gorged themselves. In the case of sheep the chilling influence of the roots is greatly aggravated by the fact that the surroundings of the poor dumb brutes may be extremely unfavourable, the temperature of the atmosphere being often low, and the wind, it may be, piercingly cold, while the skin of the sheep may be drenched with moisture, and the land on which it has to spend its time is wet, miry, and altogether comfortless. That such a mode of feeding, especially in the case of breeding animals, is prejudicial to health, we shall by and bye quote abundant testimony to prove; but, apart altogether from a consideration of the general health of the animal, what, we would ask, is the effect of pouring such a superabundant supply of cold water into the stomach of the poor brute? Why, just to counteract the beneficial influence of a considerable proportion of the nourishing and heat-producing elements which are contained in the solid parts of the turnips. A large proportion of the food which an animal eats is entirely used up in keeping its body warm, and in maintaining its vital movements. The food which is not used for this purpose either passes out of the body in its *excreta*, or is retained therein, being converted into permanent increase. Now a large proportion of the solid matter in the quantity of turnips consumed by an animal subsisting entirely upon them, is used up in producing heat in the body. The exact proportion consumed in this necessary function is dependent on a variety of circumstances, one of the chief of which is the temperature of the animal's body. Heat is equivalent to food, and hence if a bullock or a sheep be chilled either by its outward circumstances being cold, or by its internal warmth being greatly and suddenly reduced by a hearty meal of cold watery roots, part of the food partaken of is consumed in bringing the beast back to its normal tempera-

ture. When, therefore, the temperature of the body is reduced, as it undoubtedly is, by imbibing, in the excessive supply of turnips, a superfluity of water generally so cold as to be little above the freezing point, some of the food in the roots is used up in restoring the body to its natural degree of warmth. Consequently such of the nourishing qualities of the turnips as are expended in this work of restoration are wasted in proportion to the amount of superfluous cold water imbibed. We have seen that there is in average turnips only 1 lb. of nourishing food in proportion to every 18 lbs. of water. But when these watery bulbs are given in very large quantities to live-stock, a portion of the dry solid food is used up by the presence of the excessive supply of cold moisture imbibed, and thus one part of the bulbs counteracts the beneficial influence which the other is fitted to exert.

Inasmuch as a proportion of the food consumed by an animal is spent in heating its body, food may truly and accurately be spoken of as fuel. Now suppose that you pump a large quantity of cold water into the boiler of an engine, an extra quantity of coal or other fuel will be consumed in raising the water in the boiler to the same temperature it was in before the additional supply was pumped in. In the same way, when the temperature of an animal's body has been much reduced by swallowing, in the form of turnips, an excessive quantity of cold water, a portion of the solid matter in the bulb, which is respiratory or heat-producing, will as truly be *burned away* in restoring the temperature to its normal condition. Every one is aware that if more water is put into a boiler than will produce the steam necessary to overtake the amount of work to be accomplished, the fuel spent in bringing that superfluous water to the boiling point is wasted. In the same way food is wasted in restoring an animal's body to its natural temperature after it has swallowed an unnecessary supply of cold water; animal heat is thereby unnecessarily consumed, the fuel for which would otherwise have been utilised as food. The degree of waste in each case is in proportion to the quantity of superfluous water, and the way to prevent the waste is to limit the liquid to as close an estimate as can be made of what is proper and necessary.

However, we would here take occasion to remark, that on no account should the risk be incurred of leaving cattle with an insufficient supply of water, either given separately or mixed in their food. Considerable as we hold the loss to be from compelling them to partake of a superabundant quantity, the loss would no doubt be even greater if they do not get enough to satisfy the cravings of nature and to replace the moisture consumed in the system. But the safeguard against this latter danger lies in giving the cattle an opportunity of drinking water at least once

daily, whatever be the quantity of bulbs on which they are being fed. This is a point, the importance of which has not been sufficiently realised by cattle-feeders in the past, though it must be added as a gratifying circumstance, that of late years farmers have been gradually becoming more alive to the advantage of attending to it. Accordingly, it is getting far from uncommon, where circumstances are favourable, to introduce water by gravitation into cattle-courts, boxes, and even stalls, so that the animals may quench their thirst when they feel inclined to do so. Many of the correspondents who have favoured us with communications on the subject of this paper dwell with emphasis upon the importance of all winter-fed cattle having access to water. It is well known that some men drink more water than others who are living otherwise on precisely the same diet. Is there any reason to doubt the existence of a similar diversity among the lower animals in regard to the inclination for and the need of moisture in some form? Besides, just as human beings, owing to a change in the state of their bodies, feel a greater need of a drink to cool their heated system at one time than another, so live-stock undergo similar changes in their state of body and general health which create in them a varying desire to quench their thirst. They will sometimes partake of water and at other times not, but they should always have the offer of it, if not constantly, at least at frequent intervals, and at the longest daily. It may be put within their power with perfect confidence, for their unerring instinct will prevent them from taking more than is good for them.

We make no apology for dwelling at such length on the watery nature of turnips, and their unsuitability on that account for being the sole or the principal food for stock, because we are persuaded that their use in excessive quantities has in many cases arisen from an imperfect realisation of their composition. There is an *argumentum ad hominem* we have heard used with good effect, which may be briefly quoted before passing from this part of the subject. Swedes we have seen to be composed of water and solid matter in the proportion of nine parts of the former to one of the latter. What would a sheep-feeder, who is in the habit of giving his flock nothing for months except turnips, think of the following recipe for mixing his grog?—"Take a quart bottle, and in it mix one glass of good whisky with nine glasses of cold spring water; partake *ad libitum*, especially when the temperature is below the freezing point, and refill the bottle as often as required." It would be safe to predict a very limited consumption of such a mixture. But that is just the proportion in which the food of his sheep is mixed, and we would ask, in all seriousness, is there any good and sufficient reason why the one should be differently treated from the other in this respect?

*Large supplies of Turnips prejudicial to the Health of Breeding Stock.*

Our object up to this point has been to show, from general considerations, that the practice of feeding cattle and sheep solely or principally upon turnips is unnatural, extravagant, and even wasteful. Before proceeding to consider what ought to be substituted for a portion of the watery roots, we would point out the important fact, that a large supply of turnips to in-calf-cows and ewes in-lamb is prejudicial to their health, and therefore is equally to be condemned on that account as it is on the ground of direct economy. The general health of feeding and store cattle and sheep suffers in a comparatively small degree from a liberal allowance of roots, unless when they get a complete surfeit of them, or where the bulbs are frosted, in which case serious consequences not infrequently ensue, especially in the case of cattle. But when live stock are pregnant, the matter is entirely changed, and experience has shown that, when in that exceptional condition, they are very liable to be injured by too large an allowance of turnips.

Large supplies of roots are believed by many experienced farmers to have a tendency to cause abortion in the case of cows in calf. Our subject is otherwise such a wide one that we did not make extensive inquiries on this branch of it. Mr William Housman, writing in the last number of "The Royal Agricultural Society of England's Journal" (vol. xvi, part 2) on the management of a shorthorn herd, says in regard to the various systems pursued in Aberdeenshire: "It has been noticed that cows casting their calves is the more common in years when there is a large supply of turnips and a small crop of straw." An eminent breeder of shorthorns in Scotland, in a communication to us in regard to this point, says: "The farm, like most in the district, is worked on the principle of supplying the stock with turnips and straw alone as food in winter. Of late years, the bad seasons have so reduced the crops of turnips grown, that occasionally we have had to depend on artificial substitutes. The prices of food cause difference in practice; but perhaps the most satisfactory plan has been to give, instead of the mid-day meal of turnips, a feed of  $1\frac{1}{2}$  lb. ground decorticated cotton cake mixed with  $1\frac{1}{2}$  lb. oat husks. In ordinary seasons we give three feeds of turnips, each weighing from 30 lbs. to 40 lbs., with about 10 lbs. of oat or barley straw; and in bad seasons we have given a night and morning feed of about 30 lbs. turnips each, and a mid-day allowance of  $1\frac{1}{2}$  lb. cotton cake and  $1\frac{1}{2}$  lb. oat husks, with a liberal supply of water and the usual allowance of straw given at three different times. Our experience has

convinced us that the feed of 3 lbs. cotton cake and oat husks keeps the cows in better condition than the third feed of say 30 lbs. turnips does. We have fewer cases of indigestion, and though our experience is not of sufficiently long standing to speak confidently on such a difficult point, we think the risk of abortion is less." The writer goes into a calculation to show that the two systems are about equal in cost; but the one meal of dry food has the advantage in practice, inasmuch as it is found better both for the health and the condition of the animals. Mr E. C. Cruickshank, Lethenty, Aberdeenshire, informs us, that since he commenced the system of giving a mixture of dry concentrated food as a substitute for a portion of the liberal supply of turnips formerly given, he has had no case of abortion during the winter months with the exception of two or three exceptional cases in which other causes were clearly traceable. His mixture consists of  $3\frac{1}{2}$  cwts. ground cotton cake,  $3\frac{1}{2}$  cwts. bran,  $3\frac{1}{2}$  cwts. ground oats, and 1 cwt. ground linseed, mixed with an ample quantity of oat husks, for a weekly supply for twenty-eight cows, costing 3s. 2d. per head per week, or  $5\frac{1}{2}$ d. daily. The daily allowance of turnips ranges from 30 lbs. to 35 lbs. for each cow. It may be interesting and useful if we quote the daily feed for each cow at Lethenty in the form of a time-table:—

6 A.M.—1 lb. bran, oats, and ground decorticated cotton cake;  $\frac{1}{4}$  lb. ground linseed mixed with oat husks.

6.30 A.M.—Barley straw.

10.30 A.M.—30 lbs. to 35 lbs. turnips, with the tops on so long as they are fresh.

5 P.M.—A mixture similar to the morning one with straw.

On this system of feeding the cows improve rapidly in condition when dry, and they maintain their condition after they are calved. Moreover, when fed in this way, they do not fall off in condition when turned out to grass in May; but the supply of food is reduced a little before they go out to grass. They have a supply of water always before them, which is a matter the importance of which cannot be over-estimated.

The cases of abortion caused by an excessive supply of turnips are decidedly more numerous with ewes in lamb than with cows in calf. The main cause of this is probably to be found in the fact that the latter class of stock always get an allowance of straw, hay, or other dry food, and that this counteracts to a considerable extent the deleterious influence of the watery bulbs; whereas breeding ewes, very commonly in many districts of Scotland and elsewhere, get nothing but turnips during a couple of months of the year, and that, too, at the most critical stage of their pregnancy,—viz., immediately before their lambing time is due. As we have already explained, it is customary in the south-west

of Scotland and other localities to fold park ewes upon the turnip fields during February and March with the twofold object of providing, as is most erroneously thought, an abundant supply of nourishing food for the expectant mothers, and also to allow the pasture fields to become clean and fresh preparatory to the advent of the lambing season. On the merits of this system we would quote the verdict and testimony of a well-known authority south of the Border, viz., Mr Coleman, Riccall Hall, York: "The practice formerly so common of stuffing breeding ewes with roots is most extravagant, most unhealthy, and most unnatural. A good turnip year in Norfolk was invariably followed by a bad lambing season. . . . It is stated in Morton's 'Cyclopædia of Agriculture' that a ewe will consume daily from one-third to one-fourth of its live weight of roots when supplied with these alone—that is, from 25 lbs. to 30 lbs daily. Of this bulk of food nine-tenths is water; the temperature of which water, in the winter, is seldom many degrees above the freezing-point. How much of the food of the animal must be burned away, so to speak, in order to raise this mass to the temperature of the body! If, moreover, the animal is lying or standing on wet ground, which can hardly be avoided, the body becomes so chilled externally as well as internally that the fœtus is starved; a number of dead or pot-bellied and weakly lambs is the result, especially from shearling ewes. The only wonder should be that any escape" ("Royal Agricultural Society's Journal," vol. i, second series, p. 246). Mr Joseph Darby, in the same journal for 1877, remarks, "For ewes heavy in lamb, however, a full supply of turnips, with no dry food of any sort as a healthful alterative, must be extremely injudicious and hazardous. The laws of physiology do not condemn the custom of allowing ewes in lamb to live entirely upon turnips more than the practical experience of flockmasters themselves. Sad losses, indeed, have accrued from persevering in the system, and yet some farmers are so hard to turn out of old ruts that in various parts of the kingdom it still holds sway."

There is perhaps no person in Great Britain who has paid so much attention to this phase of the influence of turnips as Mr Henry Woods, agent to Lord Walsingham, Merton, Thetford, Norfolk. He made it a matter of the most extensive inquiry, as well as close personal observation and study. He issued queries to many flockmasters and shepherds on the subject, and has embodied the substance of the four hundred replies which he received in an invaluable lecture, entitled, "Abortion and Mortality among Ewes" (published at the "Norwich Mercury" Office). He quotes details regarding many flocks where a large and liberal allowance of roots had been followed by a very large number of abortions. It is impossible to peruse his masterly summary of the

numerous cases reported to him without having the conviction forced upon the mind that turnips are most dangerous food to be given in large quantities without a mixture of dry food to breeding ewes. His conclusions are thus briefly stated, "I think it must be clear to any person who has followed my remarks in giving details of cases that swedes are proved to be unhealthy food for breeding ewes. I might have adduced many other cases from my returns confirmatory of this. In the few instances where the ewes have done well when feeding on swedes, the daily supply has been limited, and there has almost invariably been an allowance of other food as well. My experience has shown me that swedes are constipating and heating, and liable to disorder the system of the ewes and to produce low fever." Mr John Wilson, Willnage, Dunse (formerly of Edington Mains), in a communication to us on this subject, says:—"A full allowance of dry food along with turnips is even more essential in the case of sheep than of cattle. This is even of more importance in the case of breeding ewes than of cild sheep. Turnips alone and without stint are a most unsafe and unsuitable food for pregnant ewes, and more especially during the latter half of their period, when the rapidly-growing foetus draws so severely on the vital forces of the dam. At this stage ewes are greedy eaters, and if allowed to gorge themselves with cold watery turnips there is great risk of their casting their lambs prematurely; or worse still, of the lambs dying in the wombs and being ejected at the full time in a putrid state. It has happened several times during the past twenty years that a failure of the turnip crop has compelled flockmasters to stint their ewes as regards turnips, and to make up for this by a fuller allowance of nourishing dry food than they had been accustomed to give, with the invariable result that they have done better than in years when turnips were plentiful and lavishly used."

In explanation of the unfavourable influence of large supplies of turnips to breeding ewes, Mr Woods says (p. 37, 38):—"There is, I think, no use denying the fact that the blood derived from innutritious food taken into the stomach of a ewe is very poor in quality compared with that which is formed from sound healthy food. In such a case, the organs which ought to be supported by good and healthy blood are supplied with blood that is little better than water, and, becoming debilitated, their natural functions are impaired and weakened. The lamb in the womb of course derives its support through the blood of its mother. If that blood is weak, impure, and wanting in sustaining power, the lamb must suffer, lose vitality, and becoming nothing more nor less than an offending body to be eventually expelled from the womb. Hence the sad number of abortions which my returns unfortunately disclose. On the other hand, where ewes

have been fed with a fair allowance of good, wholesome, strengthening food, supplementing turnips, notwithstanding the unfavourableness of the season, they have remained strong and healthy, and their offspring have been strong and healthy also." The only other witness whom we will produce on this point is Mr George Armitage, M.R.C.V.S., Hertford, who, in his prize essay "On Abortions and Premature Labour in Mares, Cows, and Ewes," published in the "Transactions" (vol. iv., 1872), says:—"Again the blood of the mother may be destitute of the elements required by the foetus, and this condition is observed in animals reduced to the verge of starvation by subsisting on scanty or inferior food, &c. An exclusive diet of turnips has been known to cause abortion in a whole flock of pregnant ewes, a result due to the small quantity of nutritious elements in comparison to the large amount of water. Such causes produce, first, partial death of the mother; she becomes anæmic, and cannot give to the young that which she does not possess; and the latter, the least able to bear the want, inevitably dies, and must be expelled if the mother lives."

Mr Woods, in his lecture, refers to the prevalent impression in many parts of England, as evidenced in the replies to his queries, that superphosphate has the effect of producing less healthy turnips than bones, shown by its inducing abortion and death among sheep. In preparing the material for this paper, I drew the attention of the lecturer to Mr Jamieson's remarks on this portion of it, in the report of the Aberdeenshire Agricultural Association for 1877-78 (p. 24), to the effect that the evidences on which the above impression is founded are unsatisfactory and inadmissible. Mr Woods has kindly furnished us with the following remarks on this most important question, regarding which he is so well entitled to speak. He says, "From the testimony of four hundred sheep farmers in various parts of England, who were each good enough to answer twenty questions, and from my own personal experience and observations before my lecture was delivered in 1877, I am more than ever convinced that two kinds of roots are unhealthy food for ewes when in lamb, unless they are given in moderation and supplemented by other kinds of food. The roots to which I refer are swede turnips, when grown with any kind of manure, and common turnips when grown where a liberal allowance of superphosphate has been applied to the land, but the most dangerous of all manures is 'mineral superphosphates.' In the answers to my questions, it was shown that as many cases of abortion and loss of ewes arose from the use of swedes as food for ewes when in lamb, even when grown with rape cake, half-inch bones, or farmyard manure, as from the use of common turnips grown from mineral superphosphates. So far as my



experience goes, I have found that swede turnips are constipating and heating, and consequently the ewes, while seeming to a casual observer to be doing very well, may be gradually getting out of health from a disordered stomach, and imperceptibly drifting into a state of low fever, which, too frequently, if not almost invariably, ends in abortion and death. A careful observer of ewes fed on swede turnips will frequently see the dung of the ewe becoming dark in colour and of a hard buttony character. This should be a warning to any flockmaster to change the food of his ewes at once, or bad results will follow. Of course the heating effect of the swedes could be somewhat corrected by reducing the daily allowance and by a *liberal* use of fresh broad bran mixed with hay chaff. Too often, however, this supplementary health-giving food is omitted. It is a fixed idea amongst observing shepherds in the eastern counties of England, that turnips grown from superphosphate manure are most dangerous food for breeding ewes. I myself believe this, but probably the shepherds and myself arrive at the same conclusion from different points of view. The shepherds believe that the ewes 'lick up,' as they call it, the manure when feeding on the turnips, and so strongly is the feeling impressed upon the minds of many shepherds that nothing will induce them to pull up the roots of the turnips. My idea is, that turnips grown from superphosphates are of inferior quality, from growing very rapidly at first while feeding upon the soluble superphosphates, but when this manure is somewhat exhausted, and dry weather sets in about September, the growth of the root is checked, and a good deal of what I would almost call woody fibre is formed in the root. When ewes are fed on such turnips during winter, the food is both indigestible and innutritious. Just at the time when the lamb in the womb is, as it were, sapping the life-blood of the ewe, the poor creature is losing power by being fed on innutritious food, and the result must be death, or probably abortion first and death afterwards. If flock-masters would not be so 'penny wise,'—as unfortunately too many are,—and would give their ewes some linseed cake, crushed oats, and fresh broad bran mixed with hay chaff, then I believe that turnips grown from superphosphate manure could be fed off with breeding ewes without running the very great risk many persons now incur from the use of such roots."

*Part of the food substituted for the Turnips withheld  
should be bulky.*

But the question now presents itself, if it is unnatural, wasteful, and, in the case of some classes of stock, also prejudicial to health to give a large and especially an unlimited supply of

turnips, what substances ought to be used as substitutes for the proportion of watery bulbs withheld, and in what quantities and proportions ought these to be given? Before proceeding to attempt to answer this question, it may be proper at this stage, to remark generally, that some portion of the food so substituted should be bulky in its character. This holds good alike in regard to cattle and sheep, though in a greater degree of the former than the latter. In a valuable lecture delivered before the Dublin Society, about fifteen years ago, Mr Lawes showed, that in consequence of a difference subsisting in the proportions of intestines and stomachs, cattle can consume a coarser and more bulky food than sheep, whilst sheep again may be fed with a less nutritious food than pigs. He showed that for 100 lbs. weight the ox has  $11\frac{1}{2}$  lbs. stomach and only  $2\frac{1}{2}$  lbs. of intestines; the sheep,  $7\frac{1}{2}$  lbs. of stomach and  $3\frac{1}{2}$  lbs. intestines; whilst the pig has only  $1\frac{1}{3}$  lb. stomach to 6.2 lbs. of intestines. Thus the ox is enabled to take a larger proportion of bulky food than sheep, and sheep than pigs. Thus the size of the stomach of the ox and the sheep points to the desirability of a bulky food, inasmuch as the digestive organs of both classes being naturally adapted for disposing of bulky and but moderately nutritive food, it is essential to their comfort and healthful rumination that their food be in sufficient bulk to enable the animal at each meal to fill its paunch. No doubt a bullock could be fed pretty successfully, at least for a limited time, upon concentrated food alone, provided it has also an abundant supply of water at its command. But in such a case its digestive organs would be much more liable to become deranged than when being allowed bulky food in fair proportion to the provision which nature has made for the accommodation and digestion of its victuals, and besides a smaller portion of such concentrated food would probably be made use of, and assimilated by the system, than would be the case if it were mixed with some bulky material. It is not essential, or even of first importance, that there should be much nourishment in this filling-up substance. All that is necessary, or at least highly desirable, is that it should be sufficient to satisfy the demands of the bovine system for bulk of provender, hay, straw, oat husks, or meal seeds, bran, &c., being commonly used and very suitable. Though sheep, from their physical construction, can do with a relatively smaller proportion of bulky food than cattle, yet it is equally important to bear in mind that the above remarks apply generally to them also. Cattle always get fodder, which serves the purpose well or indifferently, according to the quantity allowed; but, not infrequently, the consumption of turnips by sheep is practically restricted, by giving them a very liberal diet of dry concentrated food, without any other bulky

provender, such as cut hay or straw being substituted for the watery bulbs withheld. If there are any truth and force in the foregoing remarks, this is a mistake so great as to justify our calling attention to it in this pointed way, even at the expense of a little repetition of idea.

*Relative profit of feeding upon Turnips alone, and with limited quantity of them and dry food substituted.*

We now approach the most important, in fact the crucial stage of this question. What are the relative profits of the two systems now under consideration,—the one being the plan of using turnips as the sole or principal food of live stock, and the other, the method of withholding a considerable proportion of the watery bulbs, and giving as a substitute a mixture of bulky and concentrated dry food? The object of the farmer being to make the largest pecuniary balance, after meeting rent, defraying labour and manure bills, and all other expenses, the primary consideration with him, is what system will show the best balance? We have already expressed our regret that experimental evidence of such an exact and reliable character as would be of itself conclusive on this matter is unfortunately not at our command. In the absence of it, we can merely appeal to the general experience of stock-owners who have tried both methods. The testimony on this point which has been furnished to us is as uniform as it is strong. We applied to several dozens of the most eminent and extensive cattle and sheep feeders in both divisions of the United Kingdom, and without one solitary exception they testify that they have been convinced alike by experience and observation, that in every respect it is decidedly more economical and profitable to give live stock a restricted daily allowance of turnips, and to substitute for the quantity withheld, dry nourishing food of one kind or other, than to give stock large supplies of cold watery bulbs. There is a considerable diversity in regard to the weight of turnips allowed the various classes of stock by different feeders. Moreover, the practice as to the kinds and quantities of substitutes employed is, as might be expected, also very various. By and bye we will quote a large number of specimens of the proportions allowed for both cattle and sheep, by a corresponding number of arable farmers. Meanwhile, we must endeavour, with such imperfect materials as are at our service, to compare the relative profits of the two systems.

There is one circumstance regarding which a large number of stock-owners have borne testimony to us in connection with this inquiry, and also at many other times, and which, indeed, we have repeatedly seen with our own eyes, and that is, that in a season

when store-cattle, owing to a superabundance of roots, have been allowed a very liberal, if not, indeed, an unlimited supply of turnips, they have proved leaner and in a lower state of health and thriving generally when turned out to the grass in spring than similar stock have been which were fed upon a moderate allowance of roots of no better quality. This corroboration of our contention cannot but carry great weight with it, for almost every stock-owner has either met with it in his own experience or has observed it in that of his neighbours or others. Here then are instances where a very liberal allowance of roots did positive harm as compared with a smaller supply where no other food was given.

Mr M'Combie of Tillyfour's recorded experience of giving his store beasts and even his commercial cattle, as he was wont to term his ordinary beefers, nothing but turnips and straw until about six weeks before they were consigned to the fat market, may be quoted as militating against this view. But there are two circumstances which seem to make that eminent feeder's experience exceptional to some extent. The one consists in the superior quality of his turnips, to the importance of which fact he himself seems to have been fully alive. The other is the fact that his cattle were generally aged, four years of age or so, when they were prepared for the market, and that they had previously been kept on superior grazing-land. At that stage the period of natural growth was past, and they had been well prepared internally by nourishing natural food in the form of grass.

On the other side of the Atlantic, where roots are not nearly so plentiful as they are here, careful experiments have been conducted with the view of economising this expensive crop, and of ascertaining what daily allowance of these can be given to stock with the greatest profit. Mr James Biggar, the delegate from Kirkcudbright to Canada in 1879, speaking in his report of the work at the Ontario School of Agriculture and Model Farm, says:—"They are at present carrying on experiments in cattle-feeding with animals of different breeds, and test the increase of live weight on the scales from time to time. Professor Brown expects each animal to gain 2 lbs. per head daily. He has found it profitable to reduce the allowance of roots to 30 lbs. or 40 lbs. daily, and allow a larger quantity of grain, &c.—6 lbs. to 10 lbs., according to circumstances." He mentions that Mr Hobson, an extensive cattle-feeder in the same district, gives 12 lbs. to 15 lbs. meal daily, and 60 lbs. roots. A Mr Donaldson in the same province found it profitable to allow 60 lbs. to 70 lbs. turnips, and from 8 lbs. to 10 lbs. meal and bran daily. The ration of roots to fattening cattle at the model farm attached to the Ontario School of Agriculture is exceptionally small, but in explanation thereof, and in forming an estimate of its expediency,

it must be borne in mind that roots are there scarce and expensive to raise, whereas concentrated dry food, such as maize, &c., is plentiful and cheap in comparison with the state of matters in this country.

We have been furnished with a statement by Mr Bryce Wright, Dowhill, Girvan, regarding three different systems of feeding cattle, which we shall use as the basis of our calculations to compare the relative profit of feeding cattle upon an unlimited supply of turnips and oat-straw, and of feeding them upon a restricted quantity of the former with two different weights and values of dry concentrated food. The different time required to make a bullock fit for the shambles according to each diet is based on Mr Wright's personal experience and observation of the three different systems. Of course farmers will form their own estimate of these figures; but we venture to affirm that they will be found a close approximation to fact, as, indeed, might be expected, considering Mr Wright's lengthened experience in this special department, and his close and accurate observation of all matters pertaining to the farm. We should explain that the calculations of expense are based on bean meal being bought at 23s. 4d. per 280 lbs., and linseed cake (Pearson's home made), at £10, 10s. per ton, turnips grown on the farm being reckoned at 10s. per ton, or 6d. per cwt. To simplify the statement as much as possible, the element of fodder is left out of account altogether, it being presumed that the same weight will be consumed in each case.

It is presumed that three bullocks or three lots of bullocks, as equal as possible in every respect, are put up to be fattened, and are fed upon different diets. The rations and estimated expense in each case will appear from the following condensed statement:—

CLASS I.—Fed on turnips alone, with straw:—

168 lbs. ( $1\frac{1}{2}$  cwt.) turnips daily, at 6d. per cwt. = 9d. per day, or 5s. 3d. per week, or 21s. per month. It is estimated that this lot must be fed in this way for *seven* months before they are fat, costing in that time £7, 7s.

CLASS II.—Fed on limited turnips (84 lbs.), with 2 lbs. bean meal, 4 lbs. linseed cake, and straw:—

84 lbs. ( $\frac{3}{4}$ cwt.) turnips, at 6d. per cwt.	. . .	4½d. per day.
2 lbs. bean meal, at 1d. per lb.	. . .	2d. „
4 lbs. linseed meal, at 1½d. per lb.	. . .	4½d. „

11d. per day,  
or 6s. 8d. per week, or 25s. 8d. per month, or £6, 8s. 4d.  
for the *five* months that will be necessary to feed each fat  
on the above diet.

CLASS III.—Fed on limited turnips (84 lbs.), with 3 lbs. bean meal, 6 lbs. linseed cake, and straw :—

84 lbs. ( $\frac{3}{4}$ cwt.) turnips, at 6d. per cwt. . . .	4 $\frac{1}{2}$ d. per day.
3 lbs. bean meal, at 1d. per lb. . . .	3d. "
6 lbs. linseed cake, at 1 $\frac{1}{2}$ d. per lb. . . .	6 $\frac{3}{4}$ d. "

1s. 2 $\frac{1}{2}$ d. per day,  
or 8s. 3 $\frac{3}{4}$ d. per week, or £1, 13s. 3d. per month, or £6, 13s.  
for the *four* months which must expire before they are fat  
when so fed.

Now it will be observed that the same quantity of roots is given in Classes II. and III., and that the sole difference in the diet consists in an additional allowance of concentrated food being supplied to the last lot, which is presumed to have the effect of shortening, by one month, the time occupied in the process of fattening. It appears that, leaving the increased value of the manure out of account in the meantime, there is a saving of 18s. 8d. each in the second lot, and of 14s. in the third as compared with the first. This, moreover, is irrespective of the extra fodder consumed by the animals in Class I., and also of the additional attendance during the two or three months that they have to be kept longer than the others.

This difference in cost of food, presumably to produce equal results, is of itself a profit by no means to be despised, but it represents only a part of the gain from restricting the roots, for the consumption of turnips in the two last classes is only one-half what is daily going on in the first, and besides, in the latter it is continued for seven months, whereas in the others it lasts for five and four months respectively. Thus, if the same weight of roots was set aside at the outset for each lot, considerably more than one-half of them is still unconsumed in the classes where artificial food has been given. At the rate of 1 $\frac{1}{2}$  cwt. per day, or 42 cwt. in a month of twenty-eight days, 14 tons 14 cwt. would be consumed in seven months. A consumption of 84 lbs., or  $\frac{3}{4}$  cwt. per day, is equivalent to 21 cwt. per month, or to 5 tons 5 cwt. in five months, and to 4 tons 4 cwt. in four months. Thus there is a balance of 9 tons 9 cwt. of unconsumed turnips in the one case, and of 10 tons 10 cwt. in the other. Accordingly, considerably more than double the number of cattle can be fed, according to either of the two last-mentioned scales of diet, as compared with the first, and, therefore, whatever profit is to be made from cattle-feeding in any year, a proportionately greater profit can be thereby cleared where the turnips are restricted, and dry concentrated food substituted. The only additional element to be estimated in the calculation, and which would modify the result to some extent, is that while the same gross weight of roots would be consumed by the larger and the smaller number of beasts, the

former would require a greater quantity of straw both for fodder and for litter.

We had intended to present the comparison between the three classes in another aspect, but our remarks on this part of the subject are already too lengthened, and we must forbear. It may be desirable, however, to indicate the purport of it in the briefest possible terms, and the reader can follow it out for himself if he feels so disposed. Take a given number of acres of turnips, say 10, at say 20 tons per acre, and calculate how many cattle these roots would feed according to the quantity allowed in each class, and an approximation may be made therefrom of the gross profit made from the specified acreage. Do not let the critical reader suppose that we image it to be all sunshine and plain sailing. When circumstances are favourable, satisfactory profits, such as we have indicated, may reasonably be anticipated, but when cattle-feeding proves little more than profitable, or positively unprofitable, through the high prices paid for stores or otherwise, all such calculations are liable to be disturbed. As we shall endeavour to show towards the close, the system must be modified and adjusted according to circumstances. We merely depict its operations when the conditions are normal.

The gain in the enhanced value of the manure from the purchased food opens up a question sufficiently wide and important to be dealt with in a separate paper, and therefore we must rest contented with turning this paragraph into little more than a finger-post to point to it. There is no surer, safer, and, we believe, more economical plan of maintaining a farm in high manurial condition than the consumption of a large quantity of dry, concentrated feeding stuffs in the feeding of live-stock. It is true that the liberal expenditure of money in such a form must be gone about with care, discretion, and skill. It further requires capital, and also patience, for the indirect profit derived from it is not reaped for a time. But in comparing the two systems of feeding animals upon turnips, with or without supplemental food, the greater value of the farmyard manure in the one case than in the other must have its due weight attached to it in the calculation. There is one advantage which superior farmyard manure has in this respect to the rank and file of arable farmers which we would specify, because we are persuaded that it is not sufficiently understood and appreciated. In the absence of a chemical analysis of his soil, a farmer is so far in the dark as to what he should apply with the view of conveying to it the proper substances in their due proportions to bring it to a state of fertility. He is liable to supply some things which are not required, at least in such large proportions, and he may omit others of which it is deficient, and the presence

of which, in sufficient quantity, is indispensable to bring, so to speak, the other substances which are abundant into play. For to give heed to Liebig's "law of minimum" is to lay hold of the key—it may be a small one—without which the way to successful farming cannot be reached. All the farmer has to guide him in ordinary circumstances to the selection of his fertilisers is a general consideration of what he has taken out of the land by crops in the past, and what he proposes to extract in this way in the future. In the present state of agricultural education, most farmers, even if they had an analysis of their land, would probably not feel themselves to be competent judges of what are its principal deficiencies, and how these can be best and most economically supplied. Now we maintain that all the greater value ought to be attached to rich farmyard manure produced by cattle liberally fed upon supplemental food, because it is known it must contain a mixture, in desirable proportions, of every one of the fertilising substances, with the exception perhaps of phosphates, which almost every soil requires to make it fertile for most general purposes. It is in the end as cheap to every farmer as any other, and to most farmers it is; in existing circumstances, the safest and most desirable, inasmuch as it is most likely to convey to his soil what it really wants. Being a mixed all-round manure, it restores to the land a portion of everything that was taken from it, and special circumstances and requirements can be taken into account in the selection of the supplemental fertilisers.

The practice of using home-grown grain to a considerable extent as supplemental food for stock has much to recommend it, and never more so than at the present time. It has of late become increasingly difficult for the British farmer to dispose of various kinds of agricultural produce in their raw state with profit, unless, indeed, in special cases, where, from the proximity of his holding to favourable markets or other exceptional circumstances, he can sell it to advantage. Hence the practice of manufacturing the bulk of the crops raised into beef and mutton, thereby making them "walk to market," is being found the most remunerative to follow. But in the process of converting them into a walking condition, there is ample room for exercising skill and discretion. We would take occasion to mention, in this connection, the system pursued by Mr W. T. Sproat, Borness, Kirkcudbright—a member of a family and also a place both long associated with the best specimens of beefers produced in the south-west of Scotland. The dry-trough food used by Mr Sproat in feeding cattle consists of a mixture of various ingredients, principally oats, barley, wheat, and cake. His practice is to mix the draft-grain of the above three varieties—about equal weights of each—and to grind it in a grist mill driven



by the water-wheel used to propel the thrashing-mill. Thereafter a proportion of cake is added. When first housed, the cattle get from 4 lbs. to 5 lbs. each of this mixture daily, the allowance being gradually increased until about double the above quantity is given to each before they are disposed of prime fat. This system has many advantages, which those who pursue mixed arable farming would do well to study and imitate. Mr Sproat in thrashing his grain "draws" it carefully, so as to make the main produce really heavy and good. Consequently, for what cereals he sells, he receives the top price current in the market. But the secondary produce of the farm is made use of in the way we have described. If the latter were disposed of in its natural raw state it would be parted with at a sacrifice; whereas, when manufactured by the grist-mill and mixed, it is admirably adapted for feeding purposes. By this means the cake bill is kept down, and, moreover, the feeder knows the real ingredients of the home-produced food he is using. On the other hand, where the arable farmer sells nearly all his grain, and buys almost all the feeding stuffs for his stock, two separate profits are reaped at his expense. The purchaser of the grain has a profit in disposing of it to the consumer, such profit being often largest where the produce is of second-rate quality; and the seller of the cake or other artificial food has a profit off it, apart from the drawback that the purchaser in the latter case may not be aware of the composition of the article, and is more or less uncertain whether he is getting full market value for his money. Where Mr Sproat's method is followed, a *maximum* price is got for the produce marketed, and the remainder is put to the most profitable use without any middleman getting a slice off it in the process.

#### *Specimens of Mixed Cattle Diets.*

A number of our correspondents have kindly supplied us with a statement of the diet on which they are accustomed to feed their cattle—both feeding animals and stores—and we proceed to give specimens of these. It will be seen that in every instance very much less weight of turnips is allowed than the beasts would consume if an unlimited supply of bulbs were placed before them.

Mr David Buttar, Corstan, Coupar-Angus, gives his feeding cattle the following mixture, costing 10d. or thereby daily:—

15 lbs.	cut straw.		
56	" ( $\frac{1}{2}$ cwt.) turnips (pulpd), at 6d. per cwt.,	.	3d.
2	" linseed meal, at 1 $\frac{1}{2}$ d. per lb.,	.	3d.
4	" cotton cake (decorticated), at $\frac{3}{4}$ d. per lb.,	.	3d.
1	" treacle (diluted), at 1d. per lb.,	.	1d.
			—
			10d.

The above is given in three feeds, and after a time the richness of the mixture is increased by adding cut grain, such as oats, beans, and maize, to the extent of about 3 lbs., costing about 2d. per day extra, bringing up the daily cost of feeding to 1s. per day, exclusive of straw, but inclusive of roots. Mr Buttar thinks that 2 cwt. of turnips would be consumed by a fair-sized bullock if getting nothing else except straw, which, at 6d. per cwt., costs the same as the richer of the above diets. He adds that, "even with all this quantity of turnips, it is difficult to turn out a well-finished beast without a little cake and corn in addition."

Mr Buttar's diet for young store-cattle is as follows:—

15 lbs.	cut straw.			
28 "	( $\frac{1}{2}$ cwt.) turnips (pulped), at 6d. per cwt.,	.	.	1 $\frac{1}{2}$ d.
1 "	linseed meal, at 1 $\frac{1}{2}$ d. per lb.,	.	.	1 $\frac{1}{2}$ d.
3 "	cotton cake (undecorticated),	.	.	2d.
1 "	treacle, at 1d. per lb.,	.	.	1d.
				6d.

Mr Buttar's testimony is to the effect that, in the above mixture, costing 6d. daily, his stores are kept in much better condition than with 1 $\frac{1}{2}$  cwt. turnips, which at 6d. per cwt. would cost 9d.

Mr James Dalziel, Tinwald Shaws, Dumfries, at the commencement of the season places his feeding-cattle on the following allowances:—56 lbs. turnips, pulped, and mixed with chaff, 2 lbs. linseed cake, 2 lbs. round Waterloo cake, and 4 lbs. Indian meal well mixed with hot water. After two months, 1 lb. cake and 1 lb. meal additional are given. The average expense of the supplemental food is 1d. per lb., that is 10d. daily, or 5s. 10d. per week for each beast when the animals are on full feed. Long straw *ad libitum* is also at the command of the cattle. Mr Dalziel is of opinion that if three quarters of a cwt. of turnips were given instead of a half cwt., the cattle would not make so much progress.

We have already referred to the experience of Mr Bryce Wright, Dowhill, Girvan. Many years ago, that gentleman informs us, he used to make bullocks very fat on swedish turnips and wheat straw—an unlimited supply of each; but on this diet it took about eight months to make his cattle ripe for the butcher. Now he succeeds in making them equally fat in one-half that time by feeding them according to the following system:—He pulps the turnips and mixes them with cut hay, oat straw, or wheat chaff. To this mixture there are added 2 or 3 lbs. per head of bean-meal, the whole being allowed to stand for twenty-four hours to allow the meal and chopped fodder to become thoroughly saturated with the moisture from the turnips. The beasts are fed three times a day with this mixture—two and three year old bullocks getting about 80 lbs., and younger cattle 60 lbs. each daily. In addition, from 4 lbs. to 6 lbs. of

linseed cake (home-made) are allowed per head, according to age, with an ordinary allowance of fodder.

Mr Wilson, Ballencrieff, Drem, arranges his cattle in different sets of courts according to their forwardness in condition, and his scale of allowances in food is a graduated one,—a different quantity being given to each set. When the courts containing the first quality of beasts are cleared they are refilled from the second courts, and so on. The following is his usual scale of daily allowance for each lot:—

*First or most Advanced Lot.*

10 lbs. chaffed clover hay, at £4 per ton,	. . . . .	4½d.
56 „ (½ cwt.) turnips, at 6d. per cwt.,	. . . . .	3d.
4 „ linseed cake, at 1½d. per lb.,	. . . . .	6d.
5 „ mixed meal, at ½d. per lb.,	. . . . .	2½d.
		<hr/>
		1s. 6½d.

This, it will be seen, is exceptionally liberal feeding; but Mr Wilson, from his business in Edinburgh, has special reasons for desiring to have command of the highest quality of beef.

The second court lots are getting the following diets each day:—

5 lbs. chaffed hay, at £4 per ton,	. . . . .	2d.
5 „ straw chaff, say,	. . . . .	1d.
84 „ (¾ cwt.) turnips, at 6d. per cwt.,	. . . . .	4½d.
2 „ cotton cake (undecorticated),	. . . . .	1½d.
3 „ mixed meal, at ½d. per lb.,	. . . . .	1½d.
		<hr/>
		10½d.

The cost is here about 10½d. per day. No straw is given as fodder, but the cattle are roughly littered. In comparing the outlay on Mr Wilson's cattle with others, it should be noted that an estimate is put on fodder in the former case which has not been calculated in the latter.

As the result of testing feeding cattle on the scales during several seasons, when farming in the north of Scotland, Mr Robert Bruce, the Manor House Farm, Great Smeaton, Northallerton, was led to reduce the allowance of turnips to live stock to the extent of one-half in some instances, and one-third in others. He is satisfied, as the result of experience, that not only is there a saving to the extent of the value of the roots kept off, but that cattle make greater progress on the smaller quantity than on the larger. His present mixture is as follows:—

64 lbs. turnips, at 6d. per cwt.,	. . . . .	3½d.
4 „ barley meal, at 25s. per qr.,	. . . . .	3d.
3 „ cotton cake (decorticated) and linseed cake, mixed, at 1½d. per lb.,	. . . . .	3½d.
		<hr/>
		10d.

Mr Bruce believes that cattle will make more rapid progress on the above allowance of dry concentrated food, with 64 lbs. of turnips, than on the same allowance of the former, and 100 lbs., that is, with 36 lbs. additional turnips, the saving in roots alone being equivalent to 2d. daily for each beast. He has ascertained from experience that cattle will consume about one-fourth more roots which have been grown on light land than they will of the same variety produced on heavy clay land.

Messrs Thomas Biggar & Sons, Chapelton, Dalbeattie, feed a large number of cattle. Their daily allowance of turnips to each beast is 60 lbs., and the daily diet of supplemental food is 2 lbs. linseed cake, 2 lbs. cotton cake (decorticated), both ground into meal, 3 lbs. of Indian or Paisley meal, and 1 lb. oatmeal (Canadian). This is mixed with an equal bulk of chaff and refuse from rye-grass seed cleanings (the latter ground fine). The whole is placed in a cooler moistened with boiling water, in which fully  $\frac{1}{2}$  lb. of treacle for each beast has been dissolved, and after being allowed to lie for a few hours it is given in two feeds (6 A.M. and 1 P.M.) to the cattle. The 8 lbs. of meal is estimated at 7d., the chaff and seeds at 1d., the treacle at  $\frac{3}{4}$ d., so that the supplemental food, costing 8 $\frac{3}{4}$ d., and the turnips at 3 $\frac{1}{2}$ d., bring up the daily cost to 1s. per each beast, besides long straw, which is given *ad libitum*. The cattle are nearly three years of age, and some of them more. The turnips are placed in the troughs whole, the swedes being split into three or four pieces with a turnip chisel, and the cattle are found to eat them without difficulty in this form. Messrs Biggar believe that the salivation which takes place in the eating of the turnips, as they give them, is very conducive to digestion and to the general health of the cattle. The loose cattle have access to water at all times, and the others are offered it daily, but, while most of them partake of it at first, they gradually take less, and finally drink almost none, the water in their mixed food and turnips seeming sufficient for their necessities.

Messrs A. & J. M. Hannah, Girvan Mains, Ayrshire, pulp all their roots for their cattle, mixing chaff or cut straw with the pulp, in the proportion of two of straw in bulk to five of turnips. They have also long oat or barley straw *ad libitum*. A 6 cwt. bullock consumes about 84 lbs. of the mixture daily, and they get in addition 6 lbs. each of linseed cake, which may be estimated at 9d., besides the value of the turnips, chaff, and straw.

Mr Milne, Inverurie, Aberdeenshire, has been using the scales a good deal in testing the progress made in live-weight by cattle differently fed, but he is not sufficiently satisfied with the reliableness of his trials to warrant their being reported. However, he has on several occasions observed that cattle receiving

about one-half the usual allowance of turnips and a fair allowance of cake (from 2 lbs. to 4 lbs., according to the age of the animal) seemed to do better than cattle being fed on a full allowance of roots without cake.

Mr Thomas Bone, East Sanquhar, Ayr, pulps all his turnips. The mixture consists of pulped turnips, cut wheat or oat straw, and occasionally a portion of hay. An allowance equal to about 1 lb. of light grain (wheat, barley, and oats) bruised, is also added. The three-year old cattle get 28 lbs. to 30 lbs., gradually increased to 35 lbs., of the above mixture three times daily, and also  $3\frac{1}{2}$  lbs. of best oil cake, eventually increased to 4 lbs. Two-year old cattle get three times daily about 25 lbs. of the mixture and 2 lbs. of oil cake. All the cattle are offered water once a day, and many of them drink a considerable quantity.

Mr Cunningham, Trees, Maybole, like many others, at one time allowed his cattle an unlimited quantity of roots, but has been led by experience to see the economy and profit of restricting the quantity to a considerable extent, pulping and straw-cutting being practised with satisfactory results. There is a specialty in Mr Cunningham's management which is deserving of study and imitation. Writing to us, he says, "For a number of years now, owing to a deficiency in the turnip crop, and also more for the purpose of enabling me to wait and catch a good market, I began the use of green-cut hay for the cattle. This I do by putting the hay through the straw cutter, mixing a good allowance of meals with the hay. This is put, along with a few boiled roots, in a large cooler, and a plentiful supply of hot water poured over it. At first we gave the cattle one good feed of this daily, and as the season advanced two feeds. This is a great saving of roots, and the animals become very fond of the cooked food, and thrive well upon it."

Apart from the recommendation which green-cut rye-grass hay has for the accomplishment of the special object which Mr Cunningham has in view in using it, viz., tiding over the cattle until a favourable market can be met with, we submit that farmers generally do not estimate that class of fodder at anything like its proper value as food for cattle and also for sheep. Mr Lawes places the manurial value of a ton of clover hay consumed by stock at £2, 5s. 6d. Now, if the selling price of it is taken at £4 per ton, or 6d. per imperial stone of 14 lbs., no less than 56 per cent. of its selling value is recovered in the manure. The result of experiments on feeding (summarised by Messrs Johnston & Cameron in "Elements of Agricultural Chemistry," p. 484), conducted by different persons and in different countries, tend to show that there is as much feeding in from 8 lbs. to 10 lbs. of such hay as in from 20 lbs. to 40 lbs. of oat straw, according to its quality, or say in the average 30

lbs. If farmers would estimate the feeding and manurial worth of clover-hay at its proper value, less of it would be sold off the farm, and a greater quantity would be used in helping to economise roots in the feeding of sheep as well as of cattle.

### *Merits of System of Pulping Roots.*

Many of our correspondents pulp the roots given to cattle and also in some instances to sheep, and, without exception, they express their complete satisfaction with it. We are aware that a prejudice, more or less strong, against the system exists in the minds of many feeders of live stock. The more we have reflected on the nature of the process in itself, and the more we have heard and seen of its practical operation, we are the more enamoured with it, being satisfied that there is no other known system equal to it for using the roots and dry fodder on a farm to the best advantage. Our limits will not permit us to enter at desirable length into all its merits and recommendations; but any treatment of the subject of this paper which does not at least point out its advantages in a general way would be very incomplete. Its first obvious recommendation is that it enables the animal's food to be given in a mixed form, and this remark applies not only to the turnips and fodder, but also to the dry concentrated food, which, when ground into meal as it is found advantageous to do, can without difficulty be thoroughly incorporated with the pulped mixture. Abstract considerations and experience alike testify to the food being more readily as well as more completely digested when so mixed together than when each is given separately. The act of mastication is made as short and simple as possible, and thus the animal's belly being filled in a much shorter time than when the turnips are sliced or whole, and the fodder has to be eaten in a long form, there is more time for rest, which is a condition highly favourable for the laying on of fat. Not a movement of a limb can be made, and not a breath can be drawn that is not compensated for in food. Hence, especially in the case of animals being forced forward for the fat market, the less exertion they put forth in any form, consistent with the maintenance of their general health, the more rapidly will they lay on fat. One of the greatest recommendations of the mixture of pulped roots and chaff, or cut straw or hay, is that when taken into the stomach it does not reduce the temperature of the animal's body nearly so much as a large meal of sliced turnips does; and as heat is equivalent to food, the fattening process is promoted more rapidly by the former process than by the latter. This holds good in a limited degree even when only a moderate allowance of roots is being given to live stock, for, whatever the quantity

may be, the temperature of the body is reduced to some extent, and has to be restored to its normal condition by an expenditure of food. The difference in the atmosphere of two byres where cattle are having pulped and sliced roots respectively should convince the doubter as to which is the wholesomer and the more conducive to the general good health of the animals. Cattle having sliced roots are frequently scoured, and their dung is at all times offensive; whereas, beasts eating pulp and chaff properly prepared lick out the mangers, and are sweet.

One of the greatest recommendations in favour of a mixture of pulped roots and cut straw has yet to be stated, and as it is one to which sufficient prominence has not, in our estimation, been hitherto given in the discussion of its merits, we beg the reader to reflect carefully upon its advantages. When the mixture is allowed to lie for say twenty-four hours until it has fermented, it is practically a cooked food; and has most of the advantages of a cooked diet with none of its disadvantages. It is the moistening and virtual steaming of the straw in this process to which we attach importance, and which gives it its chief value. This is of minor moment where the fodder is fine in the stem and otherwise good in quality. But much straw and not a little hay is coarse, fibrous, and often indifferently-harvested, so that, in addition to its being so uninviting to the cattle that they do not eat it readily in a long form, it is also very difficult to digest. Hence, any simple treatment of it which is inexpensive in labour and other outlay, and tends to bring such fodder into a form decidedly more easy of digestion, ought to be valued and practised. Now, we maintain, that this is just what is done during the process of fermentation in a heap of mixed pulp and straw. The soaking and steaming softens the fibre of the straw, prepares it for the stomach, and makes it easier of digestion. If there is any good in cooking food for stock by steaming it, the very same good must be done to it by the process we have described. Moreover, it has not the drawbacks attending food cooked in the ordinary way. Such diet has a tendency to make animals fed upon it more tender and more susceptible of cold than others fed on raw produce. Hence, when turned out in early summer to the pasture fields, they are apt to feel in an extra degree any unfavourable influence, such as cold east winds, to which they may be exposed. Now, in a fermented pulp and chaffed straw mixture, while the fibre and other coarse matter in the straw is practically cooked, the food does not make the cattle or sheep fed upon it tender and readily injured by outside influences of a trying character. They are as hardy and able to bear exposure as ever. This latter consideration is one which makes pulping of great value in the case of young store cattle which have again to remain out night and day in

the pasture fields. In following this system, as, indeed, in any method which may be pursued, care should be taken to fix the proportion of roots put in the pulp and to adjust the supplemental foods also so as to avoid the danger and evil of the animal's diet being too dry and heating. A simple and at the same time safe and otherwise good criterion is to judge by the consistency of the animal's dung. Unless this precaution is constantly attended to, pulping, in common with all other methods, is not likely to be satisfactory and successful.

Many people who have not tried pulping are deterred from adopting it from an idea that the labour in carrying it out entails so great an expense as to counterbalance any good which may flow from it. Here, as in many things, the outlay on labour looks formidable when looked at from a distance, but when the question is carefully investigated and tried, it is found to be so moderate as to form no sufficient obstacle to the adoption of the system. On very small holdings a hand-pulper answers the purpose admirably for either cattle or sheep; but on extensive or even moderately-large farms the machinery must be driven by power. Where water is available, both pulper and straw cutter may be attached to the ordinary water-wheel, so that in that case the outlay in fitting up and driving the machines is trifling. Where there is a steam-engine on the farm for driving the threshing-mill it may be used, unless the engine may be of such a character that it would be too expensive to get up steam every day, where, possibly, it could not be employed for other useful purposes. But when there is not already a mill driven by horse-power, gearing can be fitted up suitable for a pulper and straw cutter, to be driven by a single horse, at a cost of about £8 or £9. Thus, where facilities in an economical form do not exist on a farm for carrying out the process, they can be provided at a comparatively small outlay.

But let us place this question of the expense of pulping roots before our readers in a more precise light. Out of a considerable number of cases reported to us we select three representative ones, and we choose them in preference to others because we are personally acquainted with the arrangements in two of them, and also, mainly, because they are fair examples of instances where the machinery is driven by water, horse, and steam power respectively. Mr Dalziel, Tinwald Shaws, Dumfries, has pulped all his roots for cattle for seventeen years with the most satisfactory results, and all classes of stock have been kept by him during that time, including dairy cows, feeding and store stock. At the time we write Mr Dalziel pulps for ninety-four head of heavy cattle, and, to supply them with roots, the pulper is driven by water-power seventy-five minutes every morning, the pulp being mixed with chaff, or when it runs short, with



cut straw, as it comes from the machine. The cost of the pulping he finds to be 9d. per day, or 5s. 3d. per week, on labour alone—equivalent to the value of  $1\frac{1}{2}$  cwt. of turnips at 6d. per cwt. Mr Todd's (Mouswald Grange) pulper is driven by a single horse by means of a gearing erected for the purpose. For each meal of pulp for about the same number of beasts (dairy cows and young cattle) that are at Tinwald Shaws the expense in labour is about 4d.—including a value put upon the time of the horse. Messrs A. & J. M. Hannah, Girvan Mains, drive their pulper by a 6-horse power horizontal engine and a Cornish boiler at a pressure of 35 lbs. The raising of the steam and the pulping can be done at a cost of 8d. per day, dross being the fuel. The machine will regularly pulp seven cartloads of turnips—equal to 4 tons—in fifteen minutes. These calculations do not include the cost of straw cutting. But not only can the ordinary grain chaff be utilised to much better purpose where pulping is practised than where it is not, but any straw needed to supplement the chaff can be cut on wet days, or when the steam is raised, as it can be stored without suffering deterioration from being kept.

This part of our paper may be appropriately closed by quoting the testimony of Mr Coleman, Riccall Hall, York, who has done much by pen and example to recommend the system of economising roots by the means of pulping them. Writing to us, that distinguished authority says—"My own experience through a considerable period is that the pulping of roots and their judicious mixture with dry food increases their efficiency to the extent of from one-third to one-fourth; in other words, 80 lbs. of pulped roots will produce an equal effect to 120 lbs. of sliced roots. On our home farm we grow 40 to 45 acres of roots—mangolds, swedes, and white turnips. The crop seldom exceeds, and often does not reach, 20 tons of mangolds, and 15 tons of swedes and common turnips per acre. We winter one hundred head of cattle of different ages and five hundred sheep. Without the economy of pulping it would be impossible to do this on so small a quantity of roots. As regards the condition of the animals, our cattle, which are sold by auction, are popular with the butchers, making the best prices in the market. This proves that the animals die well. We never use an extreme quantity of artificial food. The meal is distributed over the mass of chaff and pulp, and the cake—cotton principally—given by itself."

*Turnips as sole Food for Sheep.*

The practice, at one time universal, of feeding sheep on nothing but turnips during the winter months is still very common in many districts of Scotland. It is very rare indeed

that cattle are dependent entirely on these watery roots for their food. The system of giving them an unlimited supply of them still lingers in some localities, but everywhere they get along with them a daily allowance of straw, if not also of some other dry food. The only instances of cattle being fed exclusively on turnips which have come under our observation are the few cases where calves are folded on the turnip-fields along with sheep, and this is generally resorted to in consequence of deficient accommodation at the farm steading. But in all the great sheep-feeding districts of North Britain, the spectacle of sheep being fed on nothing but cold watery roots is a very common one. Many farmers who have become thoroughly convinced that it is unwise, extravagant, and even wasteful to give cattle an unlimited allowance of a root containing the very large proportion of 90 per cent. of water, continue to follow the practice of feeding sheep on nothing but turnips. In fact, it seems to be taken for granted that during the winter months the diets of cattle and sheep should differ from each other to this extent at least, that the former ought to get a considerable quantity of dry fodder along with their roots, but that the same reasons do not exist for giving sheep a similar proportion of such dry herbage. The same idea, in a modified form, is acted on to a much wider extent by sheep feeders who give their flocks dry concentrated feeding stuffs such as oats, peas, and cake when they are folded upon turnips, but who refrain from supplying them with any dry food of a bulky character. In short, the treatment they are subjected to in this respect seems to proceed on the tacit assumption that there is something so different in their respective constitutions, or outward circumstances, as to justify, if not positively to necessitate, this marked diversity in the diets on which cattle and sheep are fed.

We believe that there is more room for a revolution, so far as Scotland is concerned, in the too common system of feeding sheep either wholly or almost entirely upon turnips, than there is for a modification in the quantity of roots allowed to cattle. In the case of the latter class of stock the plan of restricting to a considerable degree the allowance of roots has been steadily gaining ground for many years, whereas the system of giving sheep nothing but watery bulbs is well-nigh as prevalent as ever. As the assumption we have spoken of lies at the bottom of this practice, we challenge it at the outset, and undertake to show that it is an erroneous one. There is, it is true, a difference in the physical structure of cattle and sheep to this extent, that, as shown by Mr Lawes in a lecture delivered a number of years ago before the Dublin Society, for every 100 lbs. weight, the ox has  $11\frac{1}{2}$  lbs. stomach and only  $2\frac{3}{4}$  lbs. of intestines; and the

sheep,  $7\frac{1}{2}$  lbs. of stomach and  $3\frac{1}{2}$  lbs. of intestines. In consequence of this difference in the proportion of intestines and stomachs, cattle can consume a coarser and more bulky food than sheep. Thus the latter should not get so large a proportion of straw or hay as the former, but this is the chief if not the only difference in their respective diets suggested by an examination of their physical structure. They are both graminivorous animals, and thrive equally well upon the same pasture during the summer months. When living upon grass in the open fields, their outward circumstances are precisely the same, and any difference in these circumstances during the winter months rather suggests the desirability of giving sheep a fair allowance of dry heat-producing food. Cattle at this time are generally sheltered in warm comfortable byres or courts, and in consequence they suffer little from the coldness of the temperature and the general inclemency of the weather. The outward circumstances of sheep, on the other hand—especially when they are folded upon turnips—are of a very different character. In our wet climate their coats are frequently soaked with moisture and their beds are often miry and uncomfortable to the last degree. When the temperature of their bodies is thus kept low by such external influences, is it wise and prudent to reduce it still further by filling their stomachs with a plentiful supply of nothing but watery bulbs so cold as to be little, if at all, above the freezing point? Nothing but long habit could blind a man to the desirability of giving sheep a considerable allowance of fodder, or other dry food, along with roots which contain 90 per cent. of water. In fact, sheep require less moisture in their food than cattle. In proof of this assertion we appeal to a fact which must have come under the observation of many of our readers, as it has frequently come under our own. In such a damp climate as that which prevails in the west of Scotland, the herbage is in ordinary weather so moist that feeding sheep, living upon grass alone, get as much moisture in their natural food as they require. Ewes, suckling lambs, and eild sheep getting dry concentrated food, such as oats or Indian corn, almost always drink water, but unless when the pasture is dried up during a drought, other sheep, getting nothing but grass, do not drink at the brook however frequently they may cross its channel in the course of the day. Cattle, on the other hand, grazing in the same field at the same time do quench their thirst at the passing stream. Does not this undoubted fact show that sheep can do with less moisture in their food than cattle? And do not all these considerations prove that there is as much reason to give to the former class of stock as to the latter dry heat-producing fodder, or similar food, as part of their diet?

But the question arises, what plan should be substituted for that of feeding sheep upon turnips alone which we have condemned as unnatural and wasteful? The system, as practised by the best feeders in England, which we advocate is to give ordinary feeding sheep only one-half or thereby of the quantity of roots daily which they would consume if dependent on them alone, and to give to each, as a substitute for the turnips thus withheld, from 1 lb. to 1½ lb. daily of oat chaff, cut straw, cut hay, or a mixture of both. This will suffice to keep the sheep in ordinary store condition; but in the case of clipped sheep, three-parts bred, half-bred, and similar lambs, which it is desired to push forward for the fat market, they should have an additional allowance of oats, cake, and other artificial food. Previous to the winter of 1864-65 this system had been practised only by a very few flock-masters south of the Border. But owing to the drought of 1864 the root crop of that year was very deficient everywhere in England. Sheep owners were put to their wits end so to economise their roots as to bring through their stock to the spring. Necessity proved the mother of invention, for they made 1 acre of turnips keep twice as many sheep as before; and the concurrent testimony of many eminent authorities who acted on the system was, that the sheep were in a healthier and more thriving condition than when they had an unlimited supply of roots. The deficient root crops of 1868 and 1870 again necessitated the plan being widely followed, which was done with the most satisfactory results. Subsequently, the practice of giving a proportion of dry fodder, such as straw and hay, and also of bran, along with the roots, has been regularly followed, even when it was not rendered necessary by a partial failure in the root crop. Thus it has been acknowledged that great and lasting good flowed from what was regarded at the time as an unmitigated evil.

*Turnips given to Sheep should be Cut.*

Before proceeding to specify in detail how cut fodder can be given with advantage to the different classes of sheep, we would point out the economy effected in the consumption of turnips by giving them to sheep in a cut form in troughs. The uplifting and cutting of them are not indispensable to getting the sheep to consume a liberal allowance of cut hay or cut straw, especially when these have had treacle-water sprinkled over them or other more elaborate condiment mixed with them. But many advantages follow the feeding of sheep upon cut roots as compared with leaving them to subsist upon the whole bulbs growing in the ground. In fact, the latter system is the most uneconomical, not to say positively wasteful, in which turnips can be given to sheep.

One of the indirect advantages of cutting turnips to sheep is that it affords a strong inducement to the grower to lift his roots in the late autumn or early winter and store them in pits or other form. The enormous loss of unstored turnips caused by the severe storm of January 1881 is so vividly before the minds of farmers in all parts of the country as to render it unnecessary to dwell at length on the profit of using all prudent means to protect this important root-crop from the severity of the weather. Thousands of acres of these valuable roots have been completely destroyed, entailing a heavy loss directly upon farmers at a time when, owing to the lengthened agricultural depression, many of them can ill afford it. Moreover, the indirect loss is very considerable, for the farmers have been left with live stock on their hands, which, owing to the unexpected and, we would add, the preventible scarcity of roots, must either be parted with at a heavy sacrifice, or, if they are retained, a considerable outlay must be incurred on cakes, Indian corn, and other purchased food to tide them over until the grass comes. We submit that it is false economy to incur a heavy expenditure in raising turnips and then to leave them at the mercy of the elements during the winter months. It is "a penny wise and pounds foolish" policy. Where manual labour can be procured the expense is not so great as to prove a sufficient obstacle. Where the work of shawing is paid for at the common rate of from 10d. to 1s. per 1000 lineal yards, it costs only from 5s. to 6s. per imperial acre. While topping and tailing machines are yet capable of considerable improvement, several of them do the work well, especially when the bulbs are intended for spring use, as by that time it is commonly necessary, even when the tops have been taken off in the ordinary way, to turn them over and hand-clean them before they are cut for stock. On an average there is a heavy loss of unstored roots in Scotland every fourth year, sometimes oftener, and their value would do far more than defray the cost of harvesting the whole of the turnip crop every season, even according to the most expensive process. Indeed, the loss this year alone would have sufficed to store the root crops for the next dozen years at least. To leave turnips unstored in this climate is a speculation, and too many farmers trust in this matter to the chapter of accidents. Many growers are induced to leave their turnips growing by the hope that they will increase in weight should the weather continue open. But while they do, in some seasons, become heavier, they deteriorate in quality; whereas those stored in pits become thoroughly ripened and undergo an immense improvement as food for stock in the process. The change for the better which takes place in the quality of roots properly stored is too wide a

subject to be treated at length here, but it is one to which most cattle and sheep feeders are far too little alive.

When turnips are cut and given to sheep in troughs they get their food in a much cleaner state and partake of it with a greater relish than when they are allowed to trample on them where they grew. The importance of this cannot be over-estimated, for the whole of our domesticated animals, with the exception of the pig, appreciate a clean diet. Sheep fill themselves in a comparatively short time on cut turnips, and get abundance of time to rest, which is favourable to the laying-on of fat; whereas, when left to break the bulbs for themselves, they literally "work for their meat" the greater part of the day, and thereby their progress towards maturity is retarded. This is specially the case during frosty weather, for the watery roots become at that time so hard and brick-like that it is impossible for the poor sheep to break enough off them to satisfy the cravings of nature at any particular time. They are thus kept at such a time in a half-starved condition. During January 1881, sheep dependent on uncut turnips made no progress whatever, while many of them perceptibly fell off rapidly in condition. Indeed, in such a starved condition were many of them in consequence of their inability to make an impression with their teeth upon the stone-like bulbs, that the Society for the Prevention of Cruelty to Animals could easily have made out a good case against their owners. On the other hand, notwithstanding the lowness of the temperature and the general inclemency of the weather, sheep getting cut roots with a fair allowance of supplemental dry food continued to make perceptible improvement all along. Moreover, the crop is all used up as food when the bulbs are cut, whereas a considerable proportion of it cannot be consumed by the other process, and is of service only as manure. Irrespective of other recommendations, the saving thus effected will go far to defray the expense of storing the crop and also of supplying it in a cut form to the sheep. The only solid objection which we have ever heard advanced against cutting turnips to sheep is that the manure from their droppings is not so equally distributed over the land when that plan is followed as when they are folded upon the growing crop. There is some force in this objection where the pits are put far apart and where the troughs are kept crowded near to each other. But the evil is reduced to a minimum, and, in fact, it can be entirely removed, by making the pits of moderate size and not far distant from each other, and by changing the site of the troughs from day to day. In Lincolnshire the sheep are confined on fresh ground every day. A new fold, square or parallelogram shaped, is made with nets every morning, and the sheep are confined on the new break for the day. But even

where this is not done the manure can be pretty equally distributed if sheep-feeders will only take the by no means oppressive trouble of removing the troughs a little every day or every alternate day.

*Cut Fodder with Turnips as a Diet for Sheep.*

We have already indicated in a general way the plan which we advocate as a substitute for that of giving nothing except turnips to sheep. It consists in withholding about one-half of the turnips usually given to sheep, and of substituting therefor from 1 lb. to 1½ lbs. of cut fodder, hay, straw, or chaff. The cutting of the bulbs is not an indispensable condition of this system, for some feeders who fold their flocks upon the unlifted bulbs practically restrict the quantity of turnips consumed by each animal by inducing the sheep to eat a considerable allowance of cut fodder, which is generally mixed with dry concentrated food of an inviting and palatable character, such as oats, peas, and cake.

As a specimen, we may quote the system adopted by Mr Craig, Monkton Hill, Ayr, with a fifteen score lot of three-year-old blackfaced wethers. At first they were folded on the turnip land during the day, being turned off to old lea land at night. At six o'clock A.M.—that is immediately before they were admitted to the turnip field—an allowance of 1 lb. per head of dry food was given. This supplemental food consisted of cut hay, cut corn sheaves, bruised Indian corn, and brewers' grains—about equal quantities of each. After the sheep were turned on to the lea field the same allowance was given to them. By and bye the wethers had their turnips carted to them on the pastures, and had a ¼ lb. of decorticated cotton cake added to their dry mixture. This is simply an example of a system, subject to many changes and modifications, in which the sheep made the most satisfactory progress.

But for the reasons already advanced it is preferable to uplift and break up the bulbs either by cutting them in a hand sheep-slicer or to smash them into a pulp by a pulper driven either by power or by hand. Where the turnip-slicer is used, from 10 lbs. to 12 lbs. of turnips for each sheep are given in three or four meals in troughs daily, and the cut fodder is supplied in separate troughs at least twice each day. From 20 lbs. to 24 lbs. of such roots would be consumed by an average half-bred lamb within the twenty-four hours if dependent upon them alone; and thoroughly experienced sheep-feeders on the southern side of the Border testify that one-half of these quantities are quite sufficient where about 1 lb. of bulky dry food is given, especially when some additional concentrated food, such

as oats or cake, is allowed. This mixed diet of dry and watery food, both of which are bulky, has the recommendation of avoiding two extremes which are equally to be shunned. The one consists in too liberal an allowance of cold watery bulbs without a sufficiently counterbalancing supply of dry heat-producing food. This will be seen at a glance when the constituent elements of one day's diet, where sheep are fed on turnips alone, is placed before the reader in the following tabular form. It will be seen that we presume each sheep to consume 20 lbs. of roots daily.

18 lbs. pure water.

1 lb. or slightly in excess thereof in flesh-forming, heat-producing, and fattening elements.

$\frac{2}{3}$  „ woody fibre.

$\frac{1}{3}$  „ mineral ash, and pectinous substances, similar to jelly in most kinds of fruit.

20 „ total daily allowance.

Now, here is the poor animal swallowing perhaps day by day for six months without change 18 lbs., that is within a fraction of two gallons, of water, and only the merest fraction above 1 lb. of food which is nourishing. Surely common sense condemns this as unnatural and unwise. The other extreme avoided by this mixed diet lies in giving dry food either alone or in too large a proportion, which is not only expensive as regards the first cost, but also unfavourable to the health and general thriving of the animals.

When the roots are pulped the smashed turnips and the cut straw are mixed together in the same way as the like mixture is used for cattle, and given to the sheep in troughs. In some instances hand-pulpers, costing from £3 to £3, 10s. each, are used in the field, the fodder being carted out in a cut form from the steading, where it is cut by water, steam, or horse power. In other cases the pulping is also accomplished by power at the farm offices, and the mixed pulp is carted out once a day or oftener to the field where the sheep are folded or running at large. The question which of these plans is the preferable depends entirely on the special circumstances of each farm, such as the distance of the fields from the offices, the facilities which exist for driving the pulper, and such like considerations. Our limits do not permit us to quote testimonies at our command as to the practicability and advantage of pulping roots to the various classes of sheep stock. We can testify as the result of close personal observations that the system of pulping in the fields with a hand-pulper is quite practicable without any undue strain on the man who drives the pulper. No doubt it would be too severe labour to drive such a machine all day long, but it is after all little heavier than an ordinary sheep-slicer of a



moderately large size; and, moreover, it should be borne in mind that the work is diminished by the restricted quantity of turnips consumed by a given number of sheep. Mr Bryce Wright, Dowhill, Ayrshire, may be quoted as a sheep feeder who, as the result of lengthened experience, reports favourably of the system of pulping roots at the steading by horse-power and of carting the mixture to the fields where the sheep are folded. He does not allow the mixture to lie long before being used, as he finds the sheep eat it more readily when given in a fresh form. The proportion of fodder in the heap intended for sheep is not so great as in that for cattle, and the oats, cake, &c., are mixed with the pulp, which has the recommendation of preventing individual sheep from gorging themselves with too much concentrated food.

We have already dwelt on the unsuitableness of turnips alone as food for ewes heavy in lamb. The system which we are advocating, of giving sheep a proportion of cut hay or straw, is admirably adapted for them. They thrive well upon it, and where it is practised a large flock of ewes can be brought through the winter on a comparatively small supply of roots. The quantity of each kind of food given by those who successfully follow the system in England is from 6 lbs. to 8 lbs. of roots and from 1 lb. to 1½ lbs. of cut hay or straw for each ewe. In this case the former are commonly pulped and mixed with the oat chaff or cut fodder. During the winter months, so long as the ewes are kept upon the pasture fields, they might have a considerably smaller allowance than these quantities, as they would succeed in picking up a good deal of food from the grass parks. But in very early spring—say in the end of January or beginning of February—when it is customary in many districts to remove them to the fields where the turnips were grown, with the view of having the grass fields thoroughly cleaned before lambing time comes round, they could have the mixture supplied to them in troughs, or the cut roots and cut fodder could be given separately as suggested with feeding sheep. The objections often urged against giving ewes heavy in lamb any kind of food in troughs will probably occur to not a few flockmasters, viz., that in such a system there is a great danger of the ewes “kebbing,” as abortion in sheep is commonly called in Scotland. There certainly is such a danger if the system is carelessly carried out, either from there being too few troughs or from the troughs being too much crowded together. But this is the abuse, not the use of the system. Testimony upon testimony could be quoted from English flockmasters to the effect that with ordinary prudence and care they have encountered no such evils from extensive and lengthened experience of the system.

In the winter of 1879–80 a small flock of fifty cast Cheviot

## AS FOOD FOR CATTLE AND SHEEP.

ewes were fed under our directions according to this system with unqualified success. So long as they were at large upon the pastures—which were unusually bare—they got a small daily allowance of pulped turnips and cut straw mixed. They partook of it readily, and, indeed, soon came to wait for it when the time for giving it approached. Cut hay was used for a few days at first until they became fond of it, and cut straw was by degrees substituted, it being found of great importance to cut the fodder into as short lengths as possible. On the 1st of February, or thereby, they were folded on the turnip field, and the hand-pulper which was used was removed there also. They were fed for nearly two months thereafter upon nothing but a mixture of pulped swedes and cut straw in the proportions specified above, and they thrived admirably upon this diet. Indeed they were in as high condition at lambing time as it is desirable to have ewes of the class at that time, and decidedly fatter than part of the same lot which had been folded for a couple of months upon turnips alone. There was not a single case of abortion, and while the casualties were few, none of them were in any degree traceable to the special system of feeding adopted. The lambs were strong and plump when dropped, and they and their mothers thrived subsequently as well as could be desired. There were no complaints of the pulper being heavy to drive. Our experience of the system, though comparatively limited as to the number of ewes fed according to it, was sufficient to convince us not only of its practicability, but also of its marked economy in roots, and of its adaptability for keeping lambing ewes in a healthy state, and in good condition otherwise.

### *Illustrative Examples.*

Let us now proceed to show by illustrative cases how the system we have advocated of feeding sheep upon a restricted quantity of turnips along with cut straw or hay is more economical from every point of view than the method of giving them nothing but turnips. We may explain that our calculations are based on the assumption that half-bred lambs will eat, when fed upon swedes alone, about 20 lbs. each daily, or 140 lbs. weekly. We fix the price of this weekly consumpt at 6d., which is equivalent to a small fraction under 5d. per cwt. for the turnips. We charge oat straw at 2d. per imperial stone of 14 lbs., and this is equal to £1, 6s. 8d. per ton.

Now let us take two plots, measuring 1 acre each, in a turnip field where the crop has been found to weigh 25 tons per acre. We presume the turnips to be pitted on both so that the expense on each has been the same up to this stage. Let there be folded

on each plot one hundred half-bred lambs of equal quality, the one lot being fed on turnips alone, and the other on turnips and cut straw. At the rate of 20 lbs. daily for each sheep, the gross weekly consumption by the former will be 6 tons 5 cwt., so that the 25 tons will keep them for twenty-eight days, that is four weeks. At the rate of 6d. per head weekly, the cost for the one hundred will be £2, 10s. per week, or £10 for the month.

Let each of the second lot be fed upon 10 lbs. of turnips and 1 lb. of cut straw daily. In this case the weekly consumpt of swedes will be only 70 lbs. by each sheep, the gross quantity consumed by the one hundred sheep in a week being 3 tons 2½ cwt., the cost of which, at the rate charged in the other instance, is £1, 5s. Thus the outlay on turnips on this second lot for the four weeks is £5, and one-half of the 25 tons are unconsumed. The gross quantity of straw given in the month is 1 ton 5 cwt., which at 2d. per stone, or £1, 6s. 8d. per ton, would cost £1, 13s. 4d.

Now the first lot—fed on turnips alone—costs £10 for the month, whereas the second, kept on the mixed diet, costs £6, 13s. 4d., being £5 for turnips and £1, 13s. 4d. for straw, during the same period. There is thus a saving of £3, 6s. 8d. on the second lot as compared with the first. The economy thus secured is equivalent to one-third or 33 per cent. of the outlay where turnips are the sole food. In other words, each sheep in the one plot costs 6d. per week, whereas in the other the weekly outlay on each amounts to only 4d. This difference would provide—reckoning oats at 2s. 8d. per bushel of 40 lbs.—2½ lbs. of that cereal for each sheep per week, which is at the rate of more than one-third of a lb. daily.

The illustrative cases may be stated in a slightly altered form. Let the first plot remain as before, with one hundred sheep upon it, getting nothing but turnips, costing £10 for the month, during which 25 tons are consumed. On the second plot let one hundred and fifty sheep of a similar class be folded, each being fed upon 10 lbs. of turnips and 1 lb. cut straw. At the end of the month three-fourths of the 25 tons will be consumed, leaving one-fourth, viz., 6 tons 5 cwt. unused, which at the rate charged for the others would be worth £2, 10s. The one hundred and fifty sheep will use 1 ton 17 cwt. 2 qrs. of straw in the four weeks, worth £2, 10s., exactly the money value of the unused turnips. Thus in this experiment one hundred and fifty sheep are kept on the mixed diet at precisely the same cost as is incurred on the one hundred which are fed upon turnips alone. The gain is two-fold, consisting in the direct profit of having fifty additional sheep fed, and also in the indirect gain of the greater benefit manurially of having at the rate of three sheep fed on the one plot for every two on the other.

Some of our readers may be disposed to ask, what is the comparative cost in manual and other labour in carrying out the two systems on these two plots respectively? The labour in the one case consists in cutting and putting into the troughs the 25 tons of turnips, and that in the other lies in cutting as many turnips as are used—that is 12 tons 10 cwt.—and cutting and giving to the stock the straw consumed. Now the outlay in cutting the fodder depends on the facilities which exist on the farm for accomplishing it. But on every holding there is either water, horse, or steam power attached to the thrashing-mill. The straw-cutter can easily be connected therewith, so that the cost of cutting the straw should not in any instance be reckoned at a high sum. Moreover, it should be borne in mind, as an offset to the straw cutting in the one case, that double the quantity of turnips have to be cut in the other. Thus whatever time a man is employed in cutting roots on the one plot, he is set free one-half of that time on the other, and that time would at the least be quite sufficient to cut all the straw used. Besides, cut straw is an article which remains fresh for a long time, and consequently the cutting of it can be overtaken on wet days or at other times when there is no pressure of other work. We conclude then that, as regards labour, the system we advocate is not more expensive than the one now commonly followed.

The further question will probably be asked, What of the comparative feeding properties possessed by the two diets? There is this in common in the two systems, that each sheep gets 10 lbs. of turnips daily, and the difference between them lies in the fact that in the one case it gets 10 lbs. additional swedes, and in the other case in lieu thereof 1 lb. of cut straw. The question is thus narrowed to one as to the comparative feeding qualities of 10 lbs. of turnips and 1 lb. of straw. The analysis of the former would be in a small degree superior to that of the latter. But let it be borne in mind, what has been shown in the early part of this paper, that not a little of the heat-producing and other qualities of the turnips are destroyed, or virtually so, by the superfluous quantity of water, at a low temperature, which the sheep have to swallow when living on bulbs alone. Besides, straw and hay are possessed in a considerable degree of those heat-producing properties which ought to belong to a large proportion of the food given to animals spending their time in the open air at a time of the year when, owing to the low temperature of the surrounding atmosphere, and the frequently soaked state of their own coats and the miry condition of their beds, an extra heavy waste is going on in the body. However, after all, chemical analysis in such a question must not by itself determine the matter, for, unless accompanied by the invaluable light of experience, it would not be a reliable guide. Well, many farmers

in England, who have had extensive experience of both systems, testify in the most unqualified manner that they have found the one diet to be quite as nourishing for their stock as the other.

Our calculations have been based on the assumption that straw is the kind of bulky dry material used along with the turnips as food for sheep. That fodder is well adapted for the purpose, and in the case of Cheviot and half-bred ewes, which do not require an unusually nourishing diet to maintain them in a desirable condition, it will generally be found sufficient to be mixed with the roots, without the addition of concentrated food of any kind. The plan is sometimes followed in Scotland of cutting up unthrashed oat sheaves and giving them to sheep in troughs. It is found to answer well, its chief drawback being that it is difficult to judge what quantity of oats the sheep are having supplied to them. It is an excellent plan to cut down with the reaping machine growing oats a week or ten days before they are ripe, and to prepare them, either in sheaves or broadcast like hay, for being stacked, with the view of their being put through the chaff-cutter and given to sheep. Chemists say there is almost if not quite as much nourishment in the grain at that stage as when it is fully ripe, and not only is the straw in this comparatively green state more nutritious than when ripe, but the sheep partake of it freely and with apparent relish. A portion of a crop might be chosen for this purpose, where the grain, even when fully ripe, would be limited in quantity and inferior in quality to the other cereal produce of the farm. Where hay—either meadow or rye-grass—is available, it is well suited for giving to feeding sheep along with turnips. Its nourishing properties are much greater than those of straw, and moreover, the manurial qualities of the excrement of stock fed upon it are very greatly superior to those of any kind of straw. Indeed, if the relative value of the manure obtained from the consumption of rye-grass hay was sufficiently appreciated, less of it would be sold and more of it consumed on the farm than is generally the case. Mr Lawes estimates the manurial value of clover-hay consumed by stock at £2, 5s. 6d. per ton, of meadow hay at £1, 10s. 6d., and of oat straw at only 13s. 6d.

In all cases where sheep are being pushed forward for the fat market, they ought to have a daily allowance of oats, cake, peas, or similar supplemental food. The system, widely followed in the principal sheep-feeding districts of Scotland, of sheep-feeders "taking" the turnips from the growers to be consumed by sheep at a stipulated price per acre or rate per week for each sheep, seriously militates against artificial food being given as a supplement to the roots, just as we understand the similar plan, common in Aberdeenshire, of cattle-feeders consuming turnips and straw by cattle, at a fixed price per acre for the roots,

acts as a barrier to cake and similar feeding stuffs being given to the stock. In Lincolnshire and other counties of England, cattle owners who consume in a similar way the straw and roots on a farm, are generally permitted by the agreement to give the cattle as much cake as they choose, the farmer being bound to repay them one-half the cost price of any genuine oil-cake so used. The latter readily enters into an arrangement of this kind, from a well-founded belief that he gets full value for his share of the outlay in the enriched quality of the manure made from the stock consuming the cake. If turnip growers in Scotland, who let the consumption of their roots to sheep-feeders, could have a similar conviction impressed on their minds, they would be ready to bear a portion of the expense incurred on oats, cake, &c., and thereby the practice of giving at least dry concentrated food in supplement of turnips would be widely extended.

#### *Concluding Remarks.*

If the system which we have sketched and advocated, viz., of restricting the roots given to cattle and sheep, and of substituting for the quantity thus withheld cut hay or straw, as well as dry concentrated food, be carried out on a farm, and if at the same time the same area be devoted to the growth of roots, it is obvious that the stock-keeping capabilities of the farm will be vastly increased. This will involve the purchase of additional live-stock, from which, if the rates current in the store and fat markets are similar, a fair reasonable profit may be expected to be cleared. In ordinary circumstances, though the rule is subject to several well-known exceptions, the receipts from a farm are in proportion to the number of live stock which can be properly fed upon its produce. But when keep is very abundant, store stock usually undergoes a decided rise in price, and thus, apart altogether from the capital necessary to purchase these additional animals, the in-buying price may be so high as to render the investment to a large extent a speculative one. Consequently, when the turnip crop is a very heavy one, and store cattle and sheep are realising high prices, it might be hazardous to purchase additional stock to consume the surplus roots saved by cut hay or straw being substituted for a portion of the turnips, and it might be prudent to feed say sheep almost entirely upon the latter crop, rather than buy an extra number, which, requiring to be sold again before they are fat, might leave no profit, or have to be parted with at a positive loss. The system is one which must be modified to suit existing circumstances. It must be followed with discretion in all its bearings, for it might not be prudent or profitable to carry it rigidly out in all circumstances.

On many farms where mixed husbandry is followed, the rotation might be lengthened, and thereby a smaller area would be devoted to the growth of roots, every acre of these roots being made to keep a more numerous head of stock than has hitherto been the general practice. Several obvious advantages would result from this. The labour and manure bills, the two greatest dead weights on modern arable farming, would both be considerably lessened. Besides, on not a few holdings as great a gross weight of turnips would be produced by the six-course rotation as is now done according to the five-course shift. Indeed, in some instances the yield per acre would be so much heavier, besides, the crop being sounder and surer under the seven years' rotation than under the five years' course, that the total turnip crop on the farm would be very little if at all reduced by such a lengthening of the rotation. Moreover, the extent under pasture would thereby be considerably increased, and therefore, from being able to summer a larger proportion of the live stock the farmer requires for winter feeding, he would be made less dependent on the state of the store markets in the autumn. Such an extension of the area under grass as we are suggesting might advantageously be employed in breeding an additional number of animals, and especially of cattle. Really prime beef and mutton have realised such a high price in this country for many years, that those farmers who have sold in the fat market cattle and sheep bred as well as fed by themselves have received fairly remunerative returns. Those have fared worst, and they have often fared badly, who have had to buy the animals they have fed. Too frequently, after paying for the cake and grain bills, little has been left to represent the produce of the farm consumed by the animals. Wherever practicable, therefore, the surest method for a farmer to receive for his crops, and especially for his roots, a return steady and reliable—because in as small a degree as possible dependent on the fluctuations of the market,—is to breed as large a proportion as he can of the animals which he feeds. In this way the speculative part of farming is reduced to a minimum, and the money receipts made tolerably regular and certain. We submit that these considerations, the truth and force of which are very generally acknowledged, afford strong arguments for such means as we have sketched being used to employ the root crops of the farm to the best advantage.

One of the greatest advantages of the system of feeding with a mixture of roots and dry bulky fodder is that it enables stock owners to bring through the winter their usual number of animals in such a season as that of 1879–80, when the turnip crop was an unusually small one. Those who act upon it can adjust the allowance of turnips given to stock according to the supply in

hand and to the length of time which will probably intervene before they can be turned out to the pasture fields, or disposed of to advantage in the store or fat market. Too many feeders have hitherto proceeded on the tacit assumption that cattle and sheep cannot thrive well on less than the usual liberal supply of roots. Hence it has been customary when the quantity on hand was short to continue the usual allowance until, the supply being exhausted, either the stock had to be parted with, probably at a sacrifice, or extra food, such as cakes and other feeding stuffs, had to be procured at a heavy outlay to tide them over until relief was got on the pastures. Both of these evils can be obviated in a large degree by curtailing the large allowance of turnips usually given to cattle and sheep. The truth of this was in some measure impressed on the minds of stock owners in Scotland by the short turnip crop of 1879, and still further by the great scarcity during the spring of 1881, caused by the unprecedentedly destructive frost in the first month of that year. These hard experiences will not have been unmitigated evils if they lead farmers to perceive the proper place which such a watery crop as turnips ought to occupy in providing food for live stock.

#### ACCOUNT OF THE SHOW OF THE HIGHLAND AND AGRICULTURAL SOCIETY HELD AT KELSO IN 1880.

THE Fifty-Third Annual Meeting and Show of Stock and Implements, held under the auspices of the Society, took place at Kelso from the 27th till the 30th July; and, notwithstanding almost incessant rain during the first two days, proved highly gratifying to the numerous agriculturists assembled.

The Society had visited the border district on five previous occasions, namely, Kelso in 1832—the first competition open to both sides of the Tweed; Berwick in 1841 and 1854, and Kelso in 1863 and 1872.

The exhibition in 1880, as well as those of the three previous meetings at Kelso, was held in the Bridge-end Park, the property of Sir George H. Scott Douglas of Springwood Park, Bart. The ground occupied by the yard extended over 30 acres, and was convenient in every respect, being level and admirably suited for the purposes of the show. The situation is singularly beautiful, being opposite to where the Tweed is joined by the Teviot, and within a few minutes' walk both of the railway station and the town of Kelso. From the show ground Floors Castle, the seat of the Duke of Roxburghe, with its beautiful grounds, is visible on the opposite side of the Tweed, while in front is the town, the



venerable remains of its fine old abbey being a prominent object in the view.

The yard was ready for the reception of implements on Tuesday the 20th July, and for stock on Friday the 23d, when many animals coming from long distances were stalled. Two special trains arrived on Saturday morning, bringing stock from Aberdeen and from the South. All the animals were placed in their respective stalls by 10 A.M. on Tuesday the 27th July, and the business of the Show began at 10.30, when a meeting of the General Committee and Judges was held in the Committee Room, Lord Reay, one of the vice-presidents, occupying the chair. After receiving their instructions, the Judges commenced their responsible labours at 11, at which hour the gates were opened. Rain descended at intervals, and the opening day was attended by most uncongenial weather. On this occasion, the admission of the public was by turnstiles, so that members were relieved from taking money at the gates.

The Directors and Judges dined in the evening of the first day of the show (Tuesday, 27th July) in the Cross Keys Hotel, when Mr Gillon of Wallhouse, Chairman of the Standing Committee on General Shows, presided.

On Wednesday the yard was open from 8 A.M. till 5 P.M. The wet weather which characterised the first day continued during a considerable portion of the day. The cattle parade, which was to have taken place at nine in the morning, had to be abandoned owing to the rain. The showyard meeting of members took place at 1.30; and the public banquet was held in the evening in the Corn Exchange, which was profusely decorated with flowers and banners. The purveying was under the management of Mr Theim of the Windsor Hotel, Edinburgh. The duties of the chair were well fulfilled by the Marquis of Lothian, President of the Society, and the vice-chair was occupied by Mr James Smith, Chief-Magistrate of Kelso. Among others present were Lord Arthur Cecil, Lord Reay, Lord Polwarth, Lord Napier and Ettrick, K.T.; Lord Dunglass, Sir Robert Menzies of Menzies, Bart.; Sir G. Graham Montgomery of Stanhope, Bart.; Sir Wm. Baillie of Polkemmet, Bart.; Sir John Marjoribanks of Lees, Bart.; Sir James R. Gibson Maitland of Clifton Hall, Bart.; the Rev. Dr Grant, Chaplain of the Society; Mr Campbell Swinton of Kimmerghame, and Mr Gillon of Wallhouse. The usual loyal and patriotic toasts having been given from the chair and duly honoured, the Noble Chairman proposed the toast of the evening—"The Highland and Agricultural Society of Scotland."

He said his first duty was to congratulate the Society upon the show that was now going on. As regarded numbers and quality it came up to the

reputation of former shows. He was not going to enter into a dissertation on the merits of the Shorthorns, the Ayrshires, the Leicesters, the Clydesdales, or any classes of stock, or even of the machinery; but they were all of great excellence, and merited the decision which had been come to to have a show at Kelso. For himself, he was very much against the proposal that Kelso should be omitted from the list of places visited by the Society, and he therefore felt all the more gratified that the results had borne out the wisdom of that decision. Having said that much of the show, he had to go back to that unfortunate topic, the weather, which had been so very hard upon recent shows—Kilburn, Carlisle, and now Kelso. He was afraid that the receipts would be diminished in consequence, but there were still two days to go, and it was to be hoped that the loss might yet in some degree be lessened. The Noble Chairman then thanked Sir George Douglas for his great kindness in allowing the show to be held in his park. All who knew Sir George knew how anxious he was to do anything to promote any good work, and the grant of the park was not the least of the good turns he had done to the Highland Society. The railway companies had also done much to convenience the public visiting the show, though he feared that was in face of a possible loss to themselves. Then, again, the Provost and Magistrates had done all they could to help the show, and he was sure the Society would tender them a hearty vote of thanks. His Lordship proceeded to refer to the meeting of the members held in the showyard in the afternoon, and to the financial prospects of the Society talked of at that meeting. He was glad that a decision was come to that the Finance Committee should lay a statement before members, so as to remove the prevalent erroneous ideas as to the wealth of the Society. Every one who had anything to do with committee affairs knew that it was impossible to rely upon capital unless they were able to defray expenses from the annual income. From what they had heard at the meeting, they would see that during the last two years the amount of the capital at their disposal was not more than that spoken of in the charter of the Society. When the charter was framed the capital was nothing like what it was now. He trusted that the examination would result in the financial position of the Society being shown to be in a first-class position. As regarded the chemical departments, he could not help thinking that was one of the most important branches of the Society. These shows were for the purpose of encouraging breeders of stock and agriculturists generally, and therefore he desired that the ground from which they obtained their produce should be manured in such a manner as to give the best results. He also believed that the experimental stations of the Society might be extended. As to the confidence in the Directorate, it was stated that there was a widespread feeling of dissatisfaction as to the conduct of the Directors. He was decidedly of opinion that the public of Scotland were thoroughly satisfied with the manner in which the Directors of the Society had carried on its business. It was said that in the Directorate the public voice should have more expression, and with this his Lordship had every sympathy; but he pointed out that in Scotland those who took the greatest interest in the affairs of the Society were not able to attend every meeting of the Directors, although they were always willing to give suggestions. The Directors had for some years asked, before the general meeting in January, the names of any gentlemen whom the members wished to be put upon the Directorate, but very few names had been received. It seemed that this was scarcely fair on the part of the membership, when the Directors were perfectly willing to admit a little fresh blood to the managing body. An infusion of new blood was necessary for the existence of any Society, but he thought new lines, before they were carved out, should be carefully considered. His Lordship proceeded to congratulate the meeting on the improved prospects of the season compared

with last. Recent legislation, he said, was bringing up a new phase in the relations between landlord and tenant; but in referring to this he would not speak politically, but as President of the Highland and Agricultural Society. He would not speak of Ireland, but to a question more immediately affecting them—he meant the Hares and Rabbits Bill. He did not wish to speak politically, but to say that in the position in which God had placed him as a landlord he would consider nothing but what was right and best both for the landlord and for the tenant. If it was proved that the tenants were suffering under the existing laws, he would be the first to say that they should be changed. He himself, however, had some doubt whether in many cases the tenant would benefit if that bill became law. The tenants would not be such gainers as appeared on the face of the bill at first sight. He concluded by proposing the toast of the evening, which was drunk with great enthusiasm.

Lord Napier and Ettrick, in proposing "The Health of the President, the Marquis of Lothian," said that all the features which endeared a man to his fellows were to be found in the person of the Noble Marquis; all the virtues and inclinations of a country gentleman were to be found in him; and this Society had done well in electing him—representative of an ancient house—to the post of President.

The toast was drunk with enthusiasm, and the Noble Chairman, in responding, remarked that the view he had taken of his duties was that he should merely give expression to the feelings of the members as expressed at their general meetings. Perhaps some might think that he might have initiated some reforms and changes; and it might be that he might have done so; but the opinion he held was, that his position as President should be one of strict neutrality.

Among other toasts were the Border Union Agricultural Society, proposed by Sir Graham Montgomery, and responded to by Lord Polwarth; the Judges, proposed by Mr Elliott Lockhart of Borthwickbrae, and acknowledged by Sir William Baillie, Bart.; and the Successful Competitors, by Mr Usher, Stodrig, and replied to by Mr Smith, Whittinghame.

On Thursday a delightful change in the weather took place, and the yard was again opened at 8 A.M. In the evening a ball was held in the Corn Exchange, and was attended by a large and fashionable assemblage. The music was supplied by Messrs R. J. & R. Adams' quadrille band of Glasgow; and Mr Theim, Edinburgh, was the purveyor.

On Friday the yard was opened at the same hour; the fine weather continued, and the show terminated at 5 P.M., when the removal of the stock and implements was commenced.

A Members' Club Room, with ladies' and gentlemen's lavatories attached, to which members were entitled to introduce their friends, was erected within the showyard, and was much appreciated.

During the show the Kelso band performed an excellent selection of fashionable and popular pieces, and gave universal satisfaction. The pipers of Sir Robert Menzies paraded the ground, and their music was greatly appreciated.

Professor Williams and Mr Robertson, V.S., Kelso, were appointed Veterinary Inspectors, but their duties were light, as the stock had never been seen in a more healthy condition.

The exhibition consisted of the following entries in the different classes of stock:—

*Cattle.*

	Bulls.	Cows.	Heifers.	Oxen.	Total.
Shorthorn, . . . . .	38	25	26	...	89
Polled Angus or Aberdeen, 17	8	8	22	...	47
Galloway, . . . . .	15	9	21	2	47
Ayrshire, . . . . .	12	17	12	...	41
Highland, . . . . .	10	8	17	5	40
Crosses, . . . . .	...	...	1	3	4
Jersey, . . . . .	...	1	1	...	2
Indian, . . . . .	3	2	...	...	5
	<u>95</u>	<u>70</u>	<u>100</u>	<u>10</u>	<u>275</u>

*Horses.*

	Stallions.	Entire Colts.	Mares.	Fillies.	Geldings.	Total.
For Agricultural purposes, . . . . .	22	60	19	45	11	157
Hunters and Roadsters, . . . . .	...	...	20	...	31	51
Ponies, . . . . .	...	...	15	...	3	18
	<u>22</u>	<u>60</u>	<u>54</u>	<u>45</u>	<u>45</u>	<u>226</u>

*Sheep.*

	Tups.	Ewes.	Gimmers.	Lambs.	Wethers.	Total.
Cheviot, . . . . .	43	15	20	15	5	98
Blackfaced, . . . . .	38	20	25	20	5	108
Border Leicester, . . . . .	78	35	55	10	...	178
Leicester, . . . . .	2	...	...	...	...	2
Cotswold and Lincoln, . . . . .	3	10	5	...	...	18
Short Woolled, . . . . .	22	15	30	...	...	67
Half-bred, . . . . .	...	...	...	...	5	5
Breton, . . . . .	2	5	...	5	...	12
	<u>188</u>	<u>100</u>	<u>135</u>	<u>50</u>	<u>15</u>	<u>488</u>

*Swine.*

	Boars.	Sows.	Pigs.	Total.
Large breed, . . . . .	2	3	12	17
Berkshire breed, . . . . .	4	3	12	19
Small breed, . . . . .	1	2	3	6
	<u>7</u>	<u>8</u>	<u>27</u>	<u>42</u>

Poultry, . . . . . 202 entries.      244 head.  
 Wool, . . . . . 8 entries.  
 Implements, . . . . . 1578 entries.      139 exhibitors.

It may be interesting to give a comparative view of the exhibition of stock and implements, the premiums offered, and the receipts at each of the shows in the Border district:—

		Cattle.	Horses.	Sheep.	Swine.	Poul-try.	Imple-ments.	Premium offered.	Gate Money and Catalogue
Kelso,	1832.	88	18	245	16	...	11	£530	£129
Berwick,	1841	175	96	658	33	...	60	1050	410
Berwick,	1854	179	141	771	86	264	357	1500	805
Kelso,	1863	245	127	532	49	261	1101	1300	1423
Kelso,	1872	274	214	595	56	291	1777	1888	2171
Kelso,	1880	275	226	488	42	244	1578	2671	1664

The following observations regarding the stock are taken from the notes of the Judges:—

The classes in the Shorthorn breed were well filled, and, taken as a whole, the quality of the exhibits was of a high standard. It is worthy of note that in the aged bull class the four Royal English prize bulls, as well as the reserve number bull, were shown. The bull which was first prize and cup winner at the Royal English meeting at Carlisle was placed first. This bull was bred and reared by a tenant farmer on cold clay land 700 feet above sea-level, and it surely ought to be an incentive to his brother farmers to get the best possible stock and attend to them carefully, when one of their number labouring under great disadvantages so far as climate, soil, and situation are concerned, can gain the Shorthorn Prize of the year at the two great shows in the kingdom. The two-year-old bulls made a large good class. The yearling class was of less merit than the older ones. The first prize bull is younger than others placed after him, but is of great promise. The female classes were good, and the cow class perhaps the highest in merit. The two-year-old heifers, although not numerous, were a level, good lot, while the yearling class contained some animals of great promise. A new feature in the show was the shorthorn family prize, and three splendid lots were placed before the Judges. The first prize family contained a cow with two of her female offspring, magnificent specimens of the shorthorn breed. It may be remarked that the first prize cow in the ordinary class was own sister to those two, to which reference is made, and the three females from one cow and by the same sire, drew the attention of the shorthorn breeders and were quite a feature of the show. The other two families shown were very good, and exhibited in natural breeding state.

Considering the distance Kelso is from the home of the Polled Angus or Aberdeen cattle, the number and quality of the stock were alike good and creditable; the first prize aged bull was a rare specimen of early maturity. The second was likewise a superior bull. In two-year-old bulls the competition was closer than in the aged section, especially between those awarded the first and second prizes, both very good animals, but of very different characteristics. The whole exhibits in this class were good and well brought out. The one-year-old bulls were the weakest section of this breed, both in point of number and excellence. None of the exhibits possessed great merit, but all were very fair specimens of the breed. The cows as a lot were very fair, but not superior. The first prize cow was well brought out, and was a handsome well-fleshed animal. The two-year-old heifers were a good class all over, and particularly the winner of the first prize, a heifer of great promise. The level top and quarters of the second prize deserve also special notice. The section for yearling heifers was the

strongest in point of numbers, and very creditable in general excellence. Besides those placed, the remainder were of very good quality, and possessed of merit, though small in size. The seven-year-old bull, "Young Viscount" (736), which gained the first premium at Aberdeen in 1876, and which was therefore by the rules of the Society disqualified for competition, was exhibited as extra stock, and was deservedly awarded the medium gold medal. He was looking fresh and full of life and flesh, and as active as a two-year-old. He was one of the best bulls ever exhibited, and stands unrivalled for wealth and levelness of flesh, substance, and quality.

In the Galloway class, the animal placed first in the aged bull section exhibited a great deal of style, substance, and quality, carried his flesh very evenly, and was altogether a first class specimen of the breed. The other animals in the section were very fair specimens. In the younger bull sections the first prize two-year-old, and the first yearling, were quite above average specimens, brought out in the very pink of condition, and both would be very difficult to set aside. The female sections were characterised by general excellence, not a single inferior specimen being brought forward. The Judges concurred in representing that the breeders of Galloway cattle seemed to study quality more than mere size, and that not a single over-fed animal was placed before them.

Of Ayrshires there was an excellent display, and a number of exceptionally fine specimens were to be found in the various sections. Conspicuous amongst these were the first prize aged bull and the first prize two-year-old bull. The whole section of cows and heifers in calf was also exceptionally well represented. The section of two-year-old heifers was greatly admired, it being one of the finest perhaps ever seen in any judging ring. The yearling heifers were unusually large in size.

The Highland breed was well represented both in numbers and quality, there being entries from many of the leading folds in Scotland. Although rather early in the season for seeing Highland cattle to advantage, they seemed to attract the general attention of the numerous visitors on the show ground.

The display in the fat stock class was not large, but the whole stock exhibited was good. The aged Highland ox was a very superior specimen of what this breed may be brought to. The Duke of Roxburghe showed in the extra stock a five-year-old Highland ox, for which a medium gold medal was awarded.

As extra stock the Marquis of Lothian exhibited an Indian cow and calf, and an aged and a one-year-old bull of the same breed. For these a medium and a minor gold and a silver medal were awarded. Sir John W. P. Campbell Orde of Kilmory, Bart., showed an Indian bull and cow, and was awarded a minor gold and a silver medal. Sir John Majoribanks of Lees, Bart., exhibited a cow and a heifer of the Jersey breed, and was adjudged a minor gold and a silver medal.

The stallions for agricultural purposes were a remarkably good lot. The aged section were particularly well brought out. The three-year-olds were not so equal in merit. The two-year-olds were well represented, and headed by a very stylish bay, and were on the whole a more equal lot. The yearlings also promised well. The judges had no doubt about recommending the prize horses as good specimens to breed from. Of a good class of brood mares, the first, possessing great substance with extraordinary girth and size, was an easy winner; the second was also a very powerful animal, and the third and fourth were also of fair merit. The section for mares in foal formed a good class, and the prize winners were all meritorious animals. The three-year-olds were also a very good lot. The first being shapely, stylish, and a grand mover. The two-year-olds mustered fair, and were of good quality. The first prize being an animal of the genuine

Clydesdale type, possessing size and substance, combining good shapes with freedom of movement, and was an easy winner. There was a fair class of yearlings, and the first prize winner, though not big, had nice symmetrical shapes and quality. The second was also a very meritorious animal. The others were of fair merit. In competition for the cup for mares, the first prize winner of the three-year-olds was unanimously chosen as the best. In the gelding classes, though not numerous, the animals were of great merit, and reflected credit on the exhibitors.

Of hunters, roadsters, and ponies there was a good display. The two first prize mares, with foals at foot, were of very great stamp. The three first prize winners in section for aged mares or geldings, suitable for field, were exceptionally fine animals from England. In the four-year-old section some wonderfully developed animals competed, and there was some time spent before awards could be assigned. Only one animal appeared in the section for hackneys or roadsters, and not being of superior merit, the Judges awarded it only the second prize. Ten animals competed in the section for leaping. The jumping was the best seen at any of the Society's shows. The two first prize animals were very even, and performed to perfection. In the section for mares or geldings between 13 and 14½ hands, one animal appeared, and the Judges awarded it only the second prize. A smart lot of ponies appeared in the section for mares or geldings between 12½ and 14 hands, the first prize animal being especially admired. In the section for mares and geldings under 12½ hands, a very handsome roan mare beat all the others, but the second and third prize horses were good useful animals.

The entries in the Cheviot classes were not so numerous as in some former years, but at the same time were fairly satisfactory, except among the ewes. In the character of the sheep exhibited there were indications of the change which has within the last two or three years taken place in the popular type. The sheep that till lately found general favour was an animal in which gaiety was the chief characteristic, and in which substance and wool were too often neglected. The importance of the latter qualities is now, however, as a rule being acknowledged, and greater favour is shown to hardier and more useful sheep. The possession of wide well sprung ribs and good skins has therefore very properly come to be looked upon as indispensable. At Kelso, as at other recent exhibitions, the value of these points was fully recognised, while, on the other hand, no sympathy was shown for the tendency to run to the opposite extreme of fancying an animal because his appearance was ugly and ungaily. Of the aged and two-shear tup sections the quality was satisfactory, but a fault too common, especially among the two-year-olds, was that of having harsh coarse skins. The shearling tups were rather disappointing in quality, but the female classes were good in this respect, though badly represented in regard to numbers.

The sections in the Blackfaced breed were well represented. The aged tups were very good, and also the two-year-olds. The shearlings were excellent, especially those carrying the first and second prizes, which were remarkable for substance and quality, evenly shaped, strong boned, and well woolled, and with good noses which are characteristics of what a good tup must have. The ewe sections were fair; and the lambs were exceptionally good.

As might have been expected in the middle of the Border Leicester country, that breed was well represented. In some of the classes the exhibits were more select than numerous, while in all the sections the non-descript element (which at many shows goes to constitute numbers) was almost, if not entirely, absent. The aged tup exhibited by Mr Fender was in many respects a wonderful sheep, possessing great size and substance, well woolled, and altogether an excellent specimen of the breed. Mr

Smith's prize sheep was also an animal of much merit, with rare style, good quality, and apparent usefulness. There was nothing worthy of special mention in the section of two-shear tups. In a large and excellent class of shearing tups, the Judges experienced considerable difficulty in fixing the awards, more especially that, while not overlooking the characteristic qualities of the breed, they did not think it advisable to ignore individual merit for the sake of uniformity of type. However a prominent first, regarding whose place in the prize list there could not have been much diversity of opinion, was presented in Mr Clark's magnificent shearing. The exhibits in the ewe section were uniformly good, and the same may be said in regard to the gimmers. The Courthill pen being prominent in size, quality, uniformity, and apparent good breeding. One of the most interesting contests in the sections was the Family Prize Competition, the sheep brought forward being generally creditable to the flocks they represented. The Judges were specially pleased with the family likeness and true type of breeding displayed in Mr Clark's pen, and also with the general excellence, and, in some respects more meritorious family, shown by Mr Thomson.

Of Leicesters only two animals were exhibited, a two-shear and a one-shear tup. They were fair specimens of the breed.

In the class for Cotswolds and Lincolns, only Cotswolds appeared. Numerically the representation was very meagre, a couple of two-shear and one shearing tup, and a pen of ewes comprising the entire number shown. Those shown however, were, without exception, truly made, well grown, smart, well woolled sheep, and altogether very superior specimens of the breed.

The short woolled was monopolized entirely by Shropshires, which were a pretty fair collection. Indeed, it is believed there has not, on the whole, appeared a display of the breed equal to it at any previous show of the Society. The entries in the four sections numbered thirty-one. In the section for aged tups some most excellent sheep were to be found. The tup to which the first prize was awarded was a strong, beautifully woolled three-shear; the second prize tup was also an animal of great size and style, although not so good to handle as was desirable. The third prize tup, bred in Ireland, although a great strong sheep, had a somewhat coarse look about him; while the commended tup was an uncommonly neat tight sheep, but lacking much in size and carriage. The section for shearing tups comprised sixteen entries, but the class was not characterised by great uniformity. Some of the tups were too pale in the face, displaying too much Southdown character, and a good many of them were rather wanting in true Shropshire type. The first prize ewes were very good, the second and third prize pens not nearly matched. Gimmers were represented by six pens, and although there was here again a want of uniformity, the class was on the whole a fairly good one. The first prize pen was clearly considerably ahead of any of the others, but both the second and third prize pens were sheep of large size and good quality.

Of the four sections for wethers there were only three entries; but the pen of two-shear Cheviot wethers were very good.

Only three entries of extra sheep were made. They all belonged to the Marquis of Lothian, and were of the Breton breed. Each lot was deservedly awarded a silver medal.

The pigs, though the competition was small, were a good class.

The poultry exhibited were of excellent quality. The Dorking classes were well filled and particularly praiseworthy, as were also the Scotch Greys and Game; but in most of the other varieties the prizes were awarded almost without competition.

The entries of Cheviot wool were small, but the quality was fairly good. Of blackfaced white wool there was only one entry. The Leicester wool, exhibited by Mr Tweedie, was not unworthy of mention. Great length of



staple and heavy fleeces seem to be leading characteristics of The Forest flock.

There was a good average display of Implements and other articles, possessing all the essential merits of utility and good workmanship, although there were perhaps few attractions in the way of novelty.

The Seventh Annual Exhibition of the CALEDONIAN APIARIAN SOCIETY was held within the showyard. The Society was instituted in 1874, and has ever since been patronised by the Highland Society. Its object is to foster a love of apiculture on humane and profitable principles, and to stamp out the inhuman system of killing the bees to get the honey. This Society is beginning to show its mark in the vast improvement of bee-culture which has already taken place in this country, but there is still much to be done, and it is to be hoped that the public will support the Society. Thousands of pounds could be made by the cottagers in the clover and heather-growing districts of Scotland if the bee-keepers were to take to an intelligent system of bee-culture. The energetic secretary, Mr. R. J. Bennet, 50 Gordon Street, Glasgow, will give any information wanted, and receive subscriptions, viz., 2s. 6d. per annum. A considerable collection of hives in bee gear were exhibited, including some improvements which have not hitherto been shown. There was a good collection of both comb and run honey, all shown in a very attractive style.

The Annual Show of the KELSO HORTICULTURAL SOCIETY was also held within the showyard in a neatly laid out series of marquees, and proved a great success. There were very fine collections of pot and foliage plants and roses, the latter, as well as the fruit on the tables, attracting a large amount of attention.

It only further remains to be noticed that Messrs Stuart, Mein, & Allan, nursery and seedsmen, Kelso, decorated the enclosed spaces in front of the Committee Room, laying out the ground in beautiful flower beds or miniature gardens.

As mentioned at the beginning of this report, the weather was unfavourable on the two first days of the show, and this accounts for the unsatisfactory state of the receipts, but in all other respects the exhibition was eminently successful, and well worthy of the Society.

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#### EXPERIMENTAL STATIONS.—REPORT FOR 1880.

By Dr ANDREW P. AITKEN, Chemist to the Society

#### EXPERIMENTS AT HARELAW AND PUMPHERSTON.

In the preceding volume of the "Transactions" (p. 283) an account was given of the barley crop at the Pumpherstons station for 1879, and on page 285 were tabulated the weights of grain and straw of the various plots. Since the publication of these details the crop has been analysed, and the following

table shows some of the results obtained from the analysis of the grain and straw:—

## BARLEY GRAIN, PUMPHERSTON, 1879.

No. of Plot.	Total Grain per acre.	Water per cent.	Solids per cent.	Solids per acre.	Albumenoids per cent.	Albumenoids per acre.	Ash per cent.	Ash per acre.
	lbs.			lbs.		lbs.		lbs.
1	*1532	14.2	85.8	1305	10.0	117	2.75	35.9
2	1688	14.8	85.2	1438	9.7	139	2.83	40.7
3	1605	14.9	85.1	1365	10.8	147	2.97	40.5
4	1650	14.9	85.1	1404	10.2	143	2.91	40.7
5	1177	14.5	85.5	1006	10.6	107	2.88	29.0
6	1683	14.7	85.3	1435	11.0	158	2.87	41.2
7	1386	14.8	85.2	1181	9.5	112	2.84	33.5
8	1600	14.5	85.5	1368	9.7	133	2.84	38.8
9	1268	14.6	85.4	1083	10.2	110	2.75	29.8
10	1592	14.6	85.4	1359	10.2	138	2.71	36.8
11	1036	15.3	84.7	877	8.6	75	2.79	24.4
12	1028	14.4	85.6	880	9.5	83	2.83	24.3
13	1420	14.9	85.1	1208	9.3	112	2.71	32.7
14	1434	15.1	84.9	1214	10.6	128	2.80	34.0
15	950	15.3	84.7	805	8.4	67	2.85	22.9
16	1546	14.9	85.1	1316	8.0	105	2.86	38.6
17	952	14.9	85.1	810	10.2	82	2.79	22.6
18	1139	15.0	85.0	968	9.9	96	2.79	26.9
19	1624	15.5	84.5	1372	10.6	145	2.80	38.9
20	1268	14.6	85.4	1083	8.6	93	2.76	29.8
21	1646	15.0	85.0	1399	10.8	151	2.72	38.0
22	756	15.3	84.7	640	8.2	52	2.61	16.7
23	1669	15.3	84.7	1413	8.2	115	2.82	39.8
24	1020	15.1	84.9	866	9.0	78	2.62	22.6
25	1392	15.3	84.7	1179	9.3	110	2.90	34.2
26	1446	14.7	85.3	1235	9.7	120	2.74	33.8
27	1163	15.0	85.0	988	9.7	96	3.05	30.1
28	1237	14.9	85.1	1052	10.2	107	2.75	28.8
29	1590	15.3	84.7	1347	10.8	145	2.85	38.3
30	1428	14.6	85.4	1219	9.9	120	2.68	32.6
31	a 1096	15.1	84.9	930	9.0	92	2.97	27.6
	b 1778	14.7	85.3	1516	10.8	163	2.87	43.4
32	a 1092	15.0	85.0	928	9.3	86	2.94	27.2
	b 1420	15.4	84.6	1201	9.0	108	2.91	35.0
33	a 1096	15.5	84.5	926	8.6	79	3.08	28.5
	b 1860	15.3	84.7	1575	10.3	161	3.06	48.3
34	a 1440	14.5	85.5	1230	9.7	119	2.79	34.3
	b 1492	14.8	85.2	1271	9.9	126	2.82	35.8
35	a 1296	14.7	85.3	1105	9.3	102	2.78	30.0
	b 1200	14.8	85.2	1022	8.6	88	2.71	27.6

\* Plot 1, owing to its having been at one time more highly manured than other parts of the field, gives too high a result. The produce here given is reckoned from that of the duplicate plots.

## BARLEY-STRAW, PUMPHERSTON, 1879.

Plot.	Total weight per acre.	Water per cent.	Dry matter per cent.	Dry matter per acre.	Ash per cent.	Ash per acre.	Ash in dry matter per cent.	Ash lbs. per acre.
	cwts.			cwts.				lbs.
1	27	12.3	87.7	23.7	7.0	186	7.53	199
2	26	10.8	89.2	23.2	7.1	184	7.05	182
3	27	13.3	86.7	23.4	6.7	175	6.71	176
4	28	12.8	87.2	24.4	7.3	199	7.30	199
5	21	11.9	88.1	18.5	6.8	141	7.20	138
6	29	13.6	86.4	25.0	6.6	185	6.61	185
7	28	13.6	86.4	24.3	7.1	193	7.30	198
8	30	12.2	87.8	26.3	7.3	215	7.35	216
9	24	11.4	88.6	21.3	6.8	162	6.85	162
10	30	13.6	86.4	25.9	7.0	203	7.00	202
11	23	12.2	87.8	20.2	6.8	154	6.85	154
12	17	12.7	87.3	14.8	6.5	108	6.51	108
13	27	13.7	86.3	23.3	7.2	188	7.96	207
14	29	12.4	87.6	25.4	6.7	190	7.16	203
15	20	13.4	86.6	17.3	7.0	136	7.54	145
16	29	13.4	86.6	25.1	6.9	194	7.50	210
17	17	12.1	87.9	14.9	6.8	113	7.25	129
18	19	13.9	86.1	16.3	6.9	126	7.31	133
19	31	13.4	86.6	26.8	6.7	201	...	...
20	24	13.6	86.4	20.7	6.8	157	...	...
21	29	13.5	86.5	25.1	6.6	185	7.26	200
22	12	...	...	...	...	...	...	...
23	29	13.0	87.0	25.2	7.0	197	8.00	225
24	16	12.1	87.9	14.0	6.6	103	7.50	117
25	23	12.6	87.4	20.1	6.1	137	6.40	143
26	22	13.1	86.9	19.1	7.4	141	...	...
27	19	13.7	86.3	16.4	7.4	138	7.83	...
28	20	13.9	86.1	17.2	7.2	139	7.83	150
29	28	13.5	86.5	23.2	6.9	179	7.51	194
30	24	12.8	87.2	20.9	6.7	157	6.93	161
31	a	20	...	...	...	...	...	...
	b	32	...	...	...	...	...	...
32	a	20	13.2	86.8	27.7	...	...	...
	b	30	13.3	86.7	...	...	...	...
33	a	20	...	...	...	...	...	...
	b	32	13.5	86.5	17.3	...	...	...
34	a	22	13.6	86.4	27.6	...	...	...
	b	32	12.3	87.7	19.3	...	...	...
35	a	24	13.2	86.8	27.8	...	...	...
	b	20	12.7	87.3	20.9	...	...	...
	b	20	13.1	86.9	17.4	...	...	...

The first ten plots are designed to test the efficacy of the various forms of phosphatic manures both in the dissolved and undissolved form.\* The relative merits of dissolved and undissolved phosphates as a manure for the turnip crop has recently received a considerable share of attention, and it is only right in estimating their relative merits that their effects upon other

\* See "Scheme of Experiments," p. 376.

crops of the rotation should also be considered. In the following table the results as given above are arranged to show the effect of these two forms of phosphate upon the barley crop at Pumpherston :—

## UNDISSOLVED PHOSPHATES, GRAIN.

Plot.	Kind of Phosphate.	Total grain per acre.	Dry matter per cent.	Dry matter per acre.	Albumenoids per cent.	Albumenoids per acre.	Ash per cent.	Ash per acre.
		lbs.		lbs.		lbs.		lbs.
1	Bone ash . . . .	1522	85.8	1305	10.0	117	2.75	35.9
3	Ground coprolites . . . .	1605	85.1	1365	10.8	147	2.97	40.5
5	Bone dust . . . .	1177	85.5	1006	10.6	107	2.88	29.0
7	Phosphatic guano . . . .	1386	85.2	1181	9.5	112	2.84	33.5
9	Ground Curaçoa phosphates . . . .	1268	85.4	1083	10.2	110	2.75	29.8
	Average . . . .	1392	85.4	1188	10.2	118	2.80	33.7
DISSOLVED PHOSPHATES, GRAIN.								
		lbs.		lbs.		lbs.		
2	Bone ash . . . .	1688	85.2	1438	9.7	139	2.83	40.7
4	Ground coprolites . . . .	1650	85.1	1404	10.2	143	2.91	40.7
6	Bone dust . . . .	1683	85.3	1435	11.0	158	2.87	41.2
8	Phosphatic guano . . . .	1600	85.5	1368	9.7	138	2.84	38.8
10	Ground Curaçoa phosphates . . . .	1592	85.4	1359	10.2	138	2.71	36.8
	Average . . . .	1643	85.3	1401	10.1	143	2.83	38.4
	Excess of undissolved phosphates . . . .	...	0.1	...	0.1	...	...	...
	Excess of dissolved phosphates . . . .	251	...	213	...	25	.03	4.7

## UNDISSOLVED PHOSPHATES, STRAW.

Plot.	Kind of Phosphate.	Total Straw per acre.	Dry matter per cent.	Dry matter per acre.	Ash per cent.	Ash per acre.
		cwts.		cwts.		
1	Bone ash . . . . .	27	87.7	23.7	7.0	186
3	Ground coprolites . . . . .	27	86.7	23.4	6.7	175
5	Bone dust . . . . .	21	88.1	18.5	6.8	141
7	Phosphate guano . . . . .	28	86.4	24.3	7.1	193
9	Ground Curaçoa phosphate . . . . .	24	88.6	21.3	6.8	162
	Average . . . . .	25.4	87.5	22.2	6.9	171

## DISSOLVED PHOSPHATES, STRAW.

Plot.	Kind of Phosphate.	Total Straw per acre.	Dry matter per cent.	Dry matter per acre.	Ash per cent.	Ash per acre.
		cwts.		cwts.		
1	Bone ash, . . . . .	26	89.2	23.2	7.1	184
3	Ground coprolites . . . .	28	87.2	24.4	7.3	199
5	Bone dust . . . . .	29	86.4	25.0	6.6	185
7	Phosphate guano . . . . .	30	87.8	26.3	7.3	215
9	Ground Curaçoa phosphate .	30	86.4	25.9	7.0	203
	Average . . . . .	28.6	87.4	24.9	7.1	197
	Excess of undissolved phosphate . . . . .	...	0.1	...	...	...
	Excess of dissolved phosphate . . . . .	3.2	...	2.7	.2	26

A glance at the first column of these tables shows that the effect of dissolving the phosphatic manures is to increase the yield of grain 251 lbs. per acre, or about 18 per cent., and that of straw about  $3\frac{1}{2}$  cwts., or about 12 per cent. The other columns show that it has no material influence upon the percentage composition of the crop. The increase is shared very equally by all the constituents of the barley, or in other words, it is the *quantity* of the crop that is increased, the *quality* is apparently unaffected. A comparison of the individual plots shows considerable variations where undissolved phosphates are used, and this is no doubt due in great measure to the different degrees of fineness of the various manures. It is evidently not fair to compare the immediate effects of undissolved phosphates of various degrees of fineness, and if these are to be more largely made use of in future, it will be necessary to establish some standard of fineness of division by which to estimate their value as manures for the crop to which they are immediately applied. There is no doubt that in the above experiment, plot 5 suffers by comparison with the other plots on account of the difficulty of reducing bone dust, unless specially prepared, to the degree of fineness attainable with the other forms of phosphate. In the case of dissolved phosphates there is no such difficulty. The process of dissolving secures a fineness of division which even the finest grinding cannot imitate, and the result is that the plots manured with dissolved phosphates are much more even in their character, and indeed may be considered almost on an equality. The cheapest form of superphosphate seems to be quite as good as the dearest form of dissolved bones,

so far as the phosphate of the manure is concerned, and if only the amount of nitrogen contained in the dissolved bones is supplied to the superphosphate in the form of ammonia salts, or other equally good nitrogenous manure, the effect upon the crop may reasonably be expected to be the same.

A minute analysis was made of the ash of the grain of the first twelve plots, and also plots 28, 29, and 30, in order to determine what effect the use of dissolved manures might have upon the amounts of phosphoric acid and potash absorbed by the grain. The amounts of soda and silica were also determined, with the following results:—

## ANALYSIS OF ASH OF GRAIN.

## UNDISSOLVED PHOSPHATES.

Plot.		Phosphoric Acid.	Potash.	Soda.	Silica.
	Bone ash . . . .	37.28	26.13	4.43	24.23
	Ground coprolites . .	36.44	23.55	4.18	25.57
	Bone dust . . . .	36.09	24.14	6.29	25.06
	Phosphatic guano . .	34.74	25.24	2.06	24.15
	Ground Curaçoa phosphate	36.25	23.36	6.61	25.92
	Average	36.16	24.48	4.71	24.98

## DISSOLVED PHOSPHATES.

2	Bone ash . . . .	36.54	24.43	4.34	24.32
4	Ground coprolites . .	32.09	21.46	1.43	24.59
6	Bone dust . . . .	36.02	22.92	7.42	25.29
8	Phosphatic guano . .	37.54	21.78	4.01	24.02
10	Ground Curaçoa phosphate	35.82	25.85	6.05	23.29
	Average . . . .	35.60	23.20	4.65	24.30

## SUPERPHOSPHATES.

27	10 per cent. soluble . .	37.03	25.81	6.27	23.92
28	20   "   . . . .	36.29	23.38	6.32	24.26
29	30   "   . . . .	33.67	25.00	3.66	23.49

A comparison of these figures shows the unexpected result, that the barley grown with dissolved phosphates has taken up a less proportion of phosphoric acid and potash than that grown with undissolved phosphates; and this is borne out by the superphosphate plots, which show that according as the solu-

bility of the phosphate is increased, the proportion of phosphoric acid in the grain diminishes. Considering the larger yield of grain obtained on the plots with the dissolved phosphates, the total phosphoric acid per acre abstracted from the soil is no doubt greater on these plots, but the individual grains are poorer in phosphoric acid than those grown with undissolved phosphates.

In other words, there is a certain amount of economy in using dissolved phosphates; we get more grain for our phosphates in that way than when we apply them undissolved. But, on the other hand, we obtain a grain which, though it may look as well as the other, is poorer as a feeding material, and has a smaller manurial value, and, what is also important to remember, is less suited for seed. For the purpose of seed we should select grain whose ash is rich in phosphoric acid, for such grain contains within it the largest store of nourishment for the young plant. Phosphorus is always closely associated with albuminoid matter, and that is what the young plant feeds on. So also we should select seed that is rich in potash, for it also is essential to the young plant. It is found associated with starchy matter, and that is the other great constituent of the food of a plant in its young state. It will also be noticed that there is a kind of balance kept up between potash and silica; barley which is rich in potash is poor in silica, and the converse, so that in this respect also, barley seed which is richer in potash is to be preferred.

Regarding the other plots on the station, there is little to add to the former report. As an indication of the character of the soil of this station, it may be interesting to refer to the crops grown on the six odd plots, 11 and 12, 17 and 18, 21 and 22.

		Total crop.		Dry Matter per acre.		Ash per acre.	
		Grain.	Straw.	Grain.	Straw.	Grain.	Straw.
		lbs.	cwts.	lbs.	cwts.	lbs.	cwts.
11	No phosphates . .	1036	23	877	20·2	24·4	154
17	No nitrogen . .	952	17	810	14·9	22·6	129
21	No potash . .	1646	29	1399	25·1	38·0	200
12	Phosphate alone . .	1028	17	880	14·8	24·3	108
18	Nitrogen alone . .	1139	19	968	16·3	26·9	133
22	Potash alone . .	756	12	640	...	16·7	...

Plot 21, which received no potash, but only its due proportion of phosphates and nitrogen, yielded a full crop, showing that there is no want of potash in the soil. On the other hand, plot 22, which got no phosphates or nitrogenous manure, but only potash, was a miserable failure, not only with the barley crop, but also with the turnip crop that preceded it. The want of

phosphates and also the want of nitrogen resulted in a short crop. In the latter case the deficiency was most apparent, and showed itself most conspicuously in the diminished produce of straw. These plots show us that we have to deal here with a soil that is rich in potash, poor in phosphates, and especially poor in available nitrogenous plant food. Indeed, these plots may be called *analytical plots*, for they furnish us with a practical agricultural analysis of the soil, which is far more useful and reliable than a chemical analysis. It is not the actual amounts of phosphoric acid, potash, and nitrogenous matter contained in a soil that a farmer requires to know, a chemist can tell him that; but what he wants to know is the amounts of these constituents in his soil which are at present available for his crops, and that is what no chemist can accurately tell him. There may be abundance of these constituents in the soil, in a form in which the plant cannot take them. The power of the roots of plants to absorb the nutriment contained in the soil is limited and peculiar, varying greatly with different kinds of plants, and there is no chemical process that can imitate the absorptive power of the root. The practical test is the only reliable one, and the farmer by making use of it, as in the plots we have just noticed, can make the plant his analyst. The form adopted on the above-mentioned plots is not the best for practical purposes. A more convenient method would be to make a *five-plot test*, requiring only three manurings, in the following manner. Select five adjacent ridges in the middle of a field, numbered from 1 to 5. To plots 1, 2, and 3 apply superphosphate, 3 cwts. per acre; to plots 2, 3, and 4 apply mixed muriate and sulphate of potash, 1 cwt. per acre; and to plots 3, 4, and 5 apply sulphate of ammonia, 1 cwt. per acre. By this arrangement plot 1 will have phosphates alone; plot 2, phosphates and potash; plot 3, phosphates, potash, and ammonia; plot 4, potash and ammonia; and plot 5, ammonia alone. The relative yield on these five plots would indicate in a most reliable manner what kind of manure it will be most profitable to apply, and also in what proportion to apply it. If a five-plot test, such as is here indicated, were applied to every field on the farm early in course of the lease, an enormous amount of money would be saved to farmers, for there is no doubt that one of the most serious sources of loss to farmers now-a-days is the misapplication of manures. Great efforts have in recent years been made to secure farmers against loss from the application of bad manures, but the loss sustained from that cause is now trifling in comparison with that incurred from the misapplication of good manures.

We come now to consider the barley crop at Harelaw station. As noticed in the former report, it was not manured, so that any



differences observed in the various plots would be due to the effects of the residue of manure left by the turnip crop of the previous year. An analysis was made of most of the plots of the barley crop, not so much on its own account, or with the expectation of eliciting any facts of importance, as for the purpose of serving as a basis of comparison for future cereal crops grown on the station. The details of the analysis are contained in the following table:—

BARLEY GRAIN, HARELAW 1879.

	Total Grain per acre.	Water per cent.	Dry Matter per cent.	Dry Matter per acre.	Albumenoids per cent.	Albumenoids per acre.	Ash per cent.	Ash per acre.	Straw per acre.
	lbs.			lbs.		lbs.		lbs.	
1	2074	14.8	85.2	1767	8.8	156	3.00	53	30
2	2320	14.5	85.5	1983	10.6	210	3.10	61	36
3	2260	13.8	86.2	1948	9.5	186	3.01	58	32
4	2156	14.4	85.6	1845	11.5	212	3.06	58	34
5	2468	15.5	84.5	2085	9.6	200	3.06	63	32
6	2332	14.2	85.8	2000	11.0	220	3.17	63	36
7	2432	14.4	85.6	2081	11.0	228	3.08	64	32
8	2332	15.6	84.4	1968	9.7	191	3.17	62	36
9	2224	14.9	85.1	1892	9.7	184	3.33	62	30
10	2402	14.4	85.6	2056	11.0	226	3.09	63	36
11	2147	14.1	85.9	1844	9.3	171	3.18	58	34
12	2260	14.7	85.2	1925	9.1	172	3.18	61	30
13	2318	14.5	85.5	1982	9.7	193	3.08	61	36
14	2328	14.7	85.3	1985	10.5	208	3.13	62	30
15	2079	14.1	85.9	1786	9.7	173	2.78	49	34
16	2230	14.3	85.7	1911	9.5	181	3.17	60	32
17	2084	14.1	85.9	1790	8.8	158	2.98	53	30
18	2344	14.8	85.2	1993	9.1	181	2.99	60	36
19	2136	14.9	85.1	1818	8.8	161	2.98	54	30
20	2072	14.8	85.2	1765	10.2	189	3.04	53	32
21	2200	14.7	85.3	1876	11.3	211	3.01	56	36
22	2060	15.0	85.0	1751	10.8	189	3.02	53	30
23	2324	14.9	85.1	1978	11.5	227	3.17	62	34
24	2128	15.0	85.0	1808	9.9	179	3.03	55	30
25	2230	14.8	85.2	1899	10.6	202	3.33	62	34
26	2048	15.5	84.5	1730	10.8	187	3.05	52	36
27	2200	15.8	84.2	1852	10.6	197	3.11	57	34
28	2000	15.5	84.5	1690	9.8	165	3.44	57	32
29	2156	14.3	85.7	1847	9.3	172	3.05	56	34
30	2076	15.6	84.4	1752	10.2	178	3.00	52	32

It will be seen that the yield of grain in the various plots differs very little. It is only in the produce of straw that any marked differences are discernible, and these correspond for the most part with the differences observed in the previous turnip crop. This is shown very clearly on a comparison of the undissolved phosphate with the dissolved phosphate plots, where the difference in favour of the latter, as regards straw, is still about 15 per cent., but as regards grain it is almost *nil*.

## UNDISSOLVED PHOSPHATES.

Plots.		Grain per acre.	Dry Matter per cent.	Dry Matter per acre.	Albumenoids per cent.	Albumenoids per acre.	Ash per cent.	Ash per acre.	Straw per acre.
		lbs.		lbs.		lbs.		lbs.	cwts.
1	Bone ash . . .	2074	85.2	1767	8.86	156	3.00	53	30
3	Ground coprolites . .	2260	86.2	1948	9.53	186	3.01	58	32
5	Bone meal . . .	2468	84.5	2085	9.65	202	3.06	63	32
7	Phosphatic guano . .	2432	85.6	2081	11.00	228	3.08	64	32
9	Ground apatite . .	2224	85.1	1892	9.75	184	3.33	62	30
	Average . . .	2292	85.3	1955	9.75	191	3.09	60	31

## DISSOLVED PHOSPHATES.

2	Bone ash . . .	2320	85.5	1983	10.64	210	3.10	61	36
4	Ground coprolites . .	2156	85.6	1845	11.53	212	3.06	56	34
6	Bone meal . . .	2332	85.8	2000	11.00	220	3.17	63	36
8	Phosphatic guano . .	2332	84.4	1968	9.75	191	3.17	62	36
10	Ground apatite . .	2402	85.6	2056	11.08	226	3.09	63	36
	Average . . .	2308	85.4	1970	10.80	212	3.12	61	35.6
	Excess of dissolved phosphates . . }	16	.1	15	1.05	21	0.3	1	...

On comparing the odd plots 11 and 12, 17 and 18, 21 and 22, it will be seen that in this station also the want of nitrogen is felt more than the want of phosphoric acid or potash; and it is evident that the use of a larger amount of nitrogenous manure would result in the obtaining of much larger crops. The amount per acre might even be doubled, not only with advantage to the crop, but also to the experiments, for the use which the plant is able to make of the mineral food presented to it in the soil is limited by the amount of nitrogenous food which it can obtain.

The experiments have shown that the nitrogenous part of the plant's food is the part that is deficient, and that the bulk of the crop is not nearly so great as the land can carry; and the inference is plain that in order to obtain heavier crops, and to test more thoroughly the various forms of the other mineral manures, at least 30 lbs. per acre of nitrogen should be applied to the cereals at the stations.

### *Hay Crop, 1880.*

The rood plots at both stations were this year under Italian rye grass, which was sown with the barley. No manures were applied to the crop, since it was impossible to apply them except as a top dressing. This would have suited well enough with the soluble manures, but would, of course, have been quite useless with the insoluble ones; and as a large proportion of the manures used in these experiments are insoluble, the committee thought it preferable to abandon the manuring for a season. It is customary to apply soluble top dressings; and especially nitrate of soda, to grass; and had this been done over the whole of the plots on the stations except on those to which nitrates are not applied, it would, doubtless, have increased the weight of the hay crop. Had the obtaining of a heavy remunerative crop been one of the chief objects of the experiments this would have been done, but as the main object of the experiments is to compare the efficacy of the various forms of manure, it was evident that the application of nitrates to a selected number of plots would have given them an advantage over the plots to which less soluble nitrogenous manures are applied, and thus have frustrated in some measure the object of the experiments. Moreover, it was thought desirable to withhold manures entirely for a season, in order to note the continued effect of former manurings upon the quantity and quality of the hay crop. As it happened, there was good reason to be satisfied that no manure had been applied, for a long drought and the prevalence of frosty east winds, which continued till the middle of July, dried up and baked the soil, whereby light manures were prevented from coming into operation, and were lost to the hay crop, which accordingly was a very short one—the shortest that has occurred in the Lothians during ten years.

Accordingly, in judging the action of the various manures, it is necessary to remember that no manure had been applied at Pumpherstons for one year and at Harelaw for two years.

The hay was made and brought in in good condition at both stations. At Harelaw a second crop was secured, but at Pumpherstons the amount of the second crop was so small that it was not weighed.

The following are the results at both stations :

	HARELAW.					PUMPHERSTON.
	First Crop. Weight per acre.		Second Crop. Weight per acre.		Total weight per acre.	First Crop. Weight per acre.
	cwts.	lbs.	cwts.	lbs.	cwts.	cwts.
1	24	104	10	4	35·0	26
2	26	0	13	68	39·5	24
3	25	80	12	92	38·5	24
4	26	74	14	68	41·2	21
5	28	16	13	36	41·5	25
6	29	0	15	24	44·2	24
7	24	0	9	84	33·7	23
8	27	68	11	56	39·0	21
9	20	64	11	12	31·6	23
10	26	80	12	60	39·2	20
11	22	88	10	64	33·4	22
12	25	72	11	52	37·0	18
13	24	104	13	52	38·4	23
14	25	8	14	64	39·7	20
15	24	72	10	104	35·5	25
16	25	8	11	8	36·0	24
17	24	56	12	44	37·0	23
18	25	64	11	40	37·0	22
19	22	80	13	24	36·0	24
20	22	80	15	28	38·0	20
21	23	0	12	88	35·7	28
22	20	96	14	28	35·0	15
23	24	72	14	0	38·0	27
24	24	80	15	28	40·0	18
25	26	80	13	108	40·7	22
26	20	48	10	12	30·5	22
27	26	96	17	36	44·2	20
28	23	0	14	0	37·0	21
29	27	0	18	92	45·8	24
30	23	0	14	68	37·6	19
31a	26	100	16	12	33·0	18
31b						22
32a						16
32b						24
33a	24	104	15	40	30·3	16
33b						28
34a	20	56	12	48	33·0	18
34b						26
35	28	100	14	28	43·0	...
37	24	108	12	84	37·7	24
38	20	64	10	8	30·6	20
39	20	64	12	56	33·0	23
40	16	56	12	84	29·0	

The second crop at Harelaw is seen to be about half the amount of the first crop ; but several plots, such as 15, 22, and

27, somewhat exceeded that proportion. Warm weather, with genial showers, favoured the second growth, so that backward plots were able to better their position considerably before the end of the growing season.

Owing to this cause, only the first crop at Harelaw should be compared with that of Pumpherstons. But even when this is done there are numerous discrepancies between the two stations. At Harelaw the dissolved phosphate plots still show a superiority of from 6 to 8 per cent., while at Pumpherstons the undissolved phosphate plots have uniformly the best of it. On comparing the plots at the latter station among themselves, it is seen that those which carried larger crops of turnips and barley produced smaller crops of hay, and this shows that the soil is in a very exhausted condition, and dependent on the immediate supply of manure for the production of a good crop. The meagre store of nourishment in the soil is especially shown on the (a) series of plots 31 to 34, which had received only half doses of manure. This poverty of soil, although from an agriculturist's point of view very undesirable, is a condition of soil which is nevertheless very suitable for experimenting.

One other circumstance requires to be noted, as affecting not only the amount but also the character of the crop of hay produced, viz., that there was no clover sown with the grass seed, and the hay therefore must be considered as of the nature of a cereal crop, and the results obtained should be compared with the barley crop which preceded it, and especially with the straw of the barley crop. Although no clover was sown, there yet appeared in many plots considerable patches of white clover. An attempt was made to classify the plots according to the abundance of clover growing on them, but, owing to its sparse and patchy distribution, this was found to be impossible.

The crop at Pumpherstons was analysed, and the following are some of the results. The amount of moisture was found to be very uniform, viz., about 14 per cent. In the following table the dry matter is therefore reckoned at 86 per cent. :—

HAY CROP, PUMPHERSTON.

	Dry Matter per acre.	Ash per cent.	Ash per acre.	Woody Fibre per cent.	Woody Fibre per acre.	Food per acre.
	cwts.		lbs.		lbs.	cwts.
1	20·6	6·32	146	35·0	807	12·1
2	20·6	6·88	158	38·3	863	11·3
3	20·6	6·03	139	35·2	812	12·1
4	18·0	7·09	143	36·2	730	10·2
	21·5	6·32	152	35·7	859	12·5
	20·6	7·19	166	35·0	807	11·9

HAY CROP, PUMPKERSTON—*continued.*

	Dry Matter per acre.	Ash per cent.	Ash per acre.	Woody Fibre per cent.	Woody Fibre per acre.	Food per acre.
	cwts.		lbs.		lbs.	cwts.
7	19.7	6.33	139	34.2	754	11.7
8	18.0	6.44	130	33.7	679	10.8
9	19.7	6.78	148	38.8	856	10.7
10	17.2	6.15	118	36.7	707	9.8
11	18.9	6.90	146	36.1	764	10.8
12	15.5	6.20	107	34.9	606	9.1
13	19.7	6.86	151	34.8	767	11.5
14	17.2	7.62	147	32.5	626	10.3
15	21.5	7.84	189	28.8	693	13.6
16	20.6	7.26	167	32.3	745	12.4
17	19.7	7.53	166	31.2	688	12.1
18	18.9	6.52	138	32.4	685	11.5
19	20.6	7.82	180	31.4	724	12.5
20	17.2	6.38	123	29.9	576	10.9
21	24.0	7.57	203	26.6	715	15.8
22	12.9	6.45	93	29.9	432	8.2
23	23.2	7.09	184	31.3	812	14.3
24	15.5	7.43	129	30.9	536	9.6
25	18.9	6.68	141	30.0	635	12.0
26	18.9	5.95	126	32.4	686	11.6
27	17.2	6.49	125	31.0	597	10.7
28	18.0	6.93	139	31.2	629	11.1
29	20.6	6.91	169	31.0	715	12.8
30	16.3	7.06	129	30.1	549	10.2

The amount of dry matter per acre taken off by the hay crop averages about a ton, or about as much as was contained in the straw of the barley crop. About one-sixteenth of this, or  $1\frac{1}{4}$  cwt., consists of mineral matter, about one-third or 7 cwts. consists of indigestible woody fibre; while the remainder represents that part of the hay which is good for food. By adding together the ash and woody fibre, and subtracting the result from the total dry matter, we obtain the figures in the last column showing the amounts of actual food obtained from the various plots. It averages a little more than half a ton per acre, and ranges from about 8 cwts. to nearly double that quantity. This is a small amount of food to take from an acre of ground, but it must be remembered that it represents only the first cutting of what was at best a very light crop, that no manure had been applied to the crop, and also that the hay consisted of Italian rye grass alone. The smallest yield was that of plot 22, which had been manured for the previous crop with sulphate of potash alone. This has all along been the poorest plot on the station, and it would almost seem as if the soil had been poisoned with sulphate of potash, for its neighbour plot 18, which received no potash,

has produced the best crop on the station. We should naturally expect that those plots which had borne light crops in previous seasons would be less exhausted than others, and show this by bearing relatively heavier crops when the manuring was discontinued, and this is shown markedly on plot 15, whose nitrogen had been supplied from shoddy, a very insoluble and therefore slowly acting form of nitrogenous manure. It had hitherto been one of the worst plots on the station, and this year it is one of the best. A similar compensatory action is noticed uniformly among the phosphate plots where hitherto those with dissolved phosphates produced the best crops. It will be seen by the subjoined table that the plots with undissolved phosphates have now the best of it:—

## UNDISSOLVED PHOSPHATES.

		Dry matter per acre.	Ash per cent.	Ash per acre.	Woody Fibre per cent.	Woody Fibre per acre.	Total Food per acre.
		cwts.		lbs.		lbs.	cwts.
1	Bone ash . . . .	20·6	6·32	146	35·0	807	12·1
3	Guano coprolites . .	20·6	6·03	139	35·2	812	12·1
5	Bone meal . . . .	21·5	6·32	152	35·7	859	12·5
7	Phosphatic guano . .	19·7	6·33	139	34·2	754	11·7
9	Ground mineral phosphate . . . .	19·7	6·78	148	38·8	856	10·7
	Average . . . .	20·4	6·35	145	35·8	817	11·8

## DISSOLVED PHOSPHATES.

2	Bone ash . . . .	20·6	6·88	158	38·3	883	11·3
4	Ground coprolites . .	18·0	7·09	143	36·2	730	10·2
6	Bone meal . . . .	20·6	7·19	166	35·0	807	11·9
8	Phosphatic guano . .	18·0	6·44	130	33·7	679	10·8
10	Ground mineral phosphates . . . .	17·2	6·15	118	36·7	707	9·8
	Average . . . .	18·9	6·75	143	36·0	761	10·8

The plots which had formerly received undissolved phosphates have produced about 5 per cent. more dry matter per acre than the others, and the hay is of superior quality, containing a small percentage of ash and woody fibre, and therefore yielding about 10 per cent. more actual food. The best of these plots is the one which has hitherto been the worst—viz., 5, which received

bone meal. This manure, though it had been ground to a coarse powder, does not seem to have come into very active operation until two years after its application. Had it been more finely ground, and if it had also been steamed to rid it of its excess of fatty matter, it would doubtless have acted more quickly; but in any case the experiment shows the beneficial effect of bone meal upon the hay crop two years after its application.

Peruvian guano also (plot 23) is a manure which has yielded a reserve of nourishment for the hay crop, while also serving as an effective manure to the crops to which it was immediately applied.

Fish guano (plot 24) has not realised the expectation entertained of it, but this is doubtless due to the oily nature of the manure. In future care will be taken to employ only *defatted* fish guano in these experiments; for it is unquestionable that this is a very important, as it is a never-failing source of phosphoric acid and ammonia, and it ought to be procurable in such a form as will make it an effective and reliable manure.

These are the more important facts brought out by the hay crop at Pumpherston. The crop at Harelaw was not analysed, as the station had not been manured since the first year of the rotation, the land being rather rich for experimental purposes. The smallness of the crop this year shows that its fertility has been considerably reduced, and the slight differences observed in the various plots shows that it is a very even field, and in good condition for the experiments which are to follow.

### *Turnip Crop, 1880.*

Owing to the new arrangement affecting the  $1\frac{1}{2}$  acre plots, these were this year put under roots. At Pumpherston, the soil appropriated to these plots had been thoroughly mixed and rendered as nearly uniform as possible; while at Harelaw the corresponding plots had not been manured for the previous barley crop. Accordingly the four-year rotation has been started on these plots two years later than on the large plots of both stations, and it is hoped by this arrangement to arrive more rapidly at the solution of the questions which are being asked in our experiments.

Before stating the results, it is necessary to say a few words regarding the character of the season, for soils which are manured with light manures alone are much more easily affected by climatic influences than those on which farmyard manure or other heavy manures are employed. If the weather is too dry, light manures have little chance of doing much good, for, as they are concentrated forms of manure, it is above all things essential that they should be dissolved by rain in order that they may be distributed through the soil. On the other



hand, if the season is a wet one, there is a danger of the more soluble part of the manure, and especially nitrates, being carried down through the soil and run off in the drains. The season of 1880 was a very dry one; and at Pumpherstons scarcely any rain fell from the time of sowing till the beginning of September. The turnips (Fosterton hybrid) were sown on the 12th June, and braided so slowly that they were not fit for singling till 12th July, but the growth was so unequal that on all the plots there were parts that were not singled till a fortnight later. In these circumstances, it was some time before the effects of the various manures were visible on the crop, but when differences were observed, it was found that the plots which had received dissolved manures took the lead just as they did two years previously. When moist, favourable weather set in, it was noticed that the other plots made rapid progress, and it seemed as if they would eventually have made good their deficiency, but the growing season was suddenly cut short by the occurrence of a severe frost on 20th October, when the thermometer registered 15° Fahrenheit. At Harelaw the crop was purple top swedes, and there also the braiding was very unequal, and it appeared for a time as if the little crop would be a failure, but after the occurrence of genial weather a great improvement took place, and, considering all things, a satisfactory result was obtained.

Plots 9 and 10 were manured with genuine Canadian apatite. These plots have always been marked as apatite plots in the scheme of experiments, but hitherto the phosphate employed was not Canadian apatite. As, however, this mineral occurs in large quantity in Canada, and has already been imported into this country, and as our experiments have been quoted in reference to it, it was considered desirable to test its efficacy alongside of another mineral phosphate equally rich in phosphate of lime. Accordingly plots 11b and 12b were manured with Curaçoa phosphate, and it will be noticed that there is a great difference in the results obtained with these two forms of manure. Only one other change has been made in these plots,—viz, plot 14b, which is a duplicate of 14 instead of being a duplicate of plot 15. The rood plot of that number has hitherto received shoddy as its nitrogenous constituent; but this form of manure has been a complete failure, and it may be questioned whether it is worth while continuing it among the experiments, especially since it is not a manure which farmers ever purchase, and is only used in small quantity by manufacturers as a source of nitrogen in highly dissolved manure. The other  $1\frac{1}{2}$  acre plots have received numbers corresponding to those of the large plots of which they are duplicates.

The following tables show the weight of bulbs grown on the various plots at both stations in lbs. per plot or in cwt. per acre,

and the proportion of dry matter and water contained in the bulbs:—

ROOT CROPS, 1880— $\frac{1}{16}$  ACRE PLOTS.

	HARELAW (SWEDES).				PUMPERSTON (YELLOWS).			
	Weights per acre.	Water per cent.	Dry Matter per cent.	Dry Matter per acre.	Weights per acre.	Water per cent.	Dry Matter per cent.	Dry Matter per acre.
	cwts.			cwts.	cwts.			cwts.
1	157	89.4	10.6	16.6	297	91.9	8.1	24.0
2	241	90.4	9.6	23.1	385	91.8	8.2	31.6
3	202	89.5	10.5	21.2	339	92.0	8.0	27.1
4	202	89.6	10.4	21.0	310	91.5	8.5	26.3
5	206	89.4	10.6	21.8	273	92.0	8.0	21.8
6	246	89.9	10.1	24.8	308	91.8	8.2	25.2
7	223	89.3	10.7	23.8	275	92.0	8.0	22.0
8	257	89.8	10.2	26.2	334	91.8	8.2	27.4
9	177	89.6	10.4	18.4	193	92.9	7.1	13.7
10	236	89.5	10.5	24.7	390	92.1	7.9	30.8
11b	211	89.7	10.3	21.7	294	92.1	7.9	23.2
12b	228	90.0	10.0	22.8	385	91.8	8.2	31.6
13	239	90.0	10.0	23.9	361	92.5	7.5	27.0
14	219	90.3	9.6	20.8	448	93.0	7.0	31.4
14b	258	90.5	9.4	24.2	346	92.4	7.6	26.3
16	252	89.5	10.5	26.4	364	92.6	7.4	26.9
28	243	90.1	9.9	24.0	381	92.6	7.4	28.2
29	248	90.4	9.6	23.8	394	93.1	6.9	27.2
30	234	89.2	10.8	24.3	397	93.0	7.0	27.8
...	...	...	...	...	252	92.6	7.4	18.6
Average	225	89.8	10.2	22.8	336	92.3	7.7	25.8

These two tables show at once the great difference between swedes and yellow turnips. The yield per acre of the latter is in this case half as much again as that of the former, but the character of the crop is very different. Swedes contain fully 10 per cent. of solid matter; while yellow turnips do not contain on an average so much as 8 per cent. In consequence of this great difference in composition, the total amount of dry matter per acre produced by the larger crop of yellows is only one-tenth more than that produced by the swedes. In the root crop two years ago the difference in composition between the swedes and yellows was not so great, but the means of determining that point were not so perfect, and differences in the amount of water contained in the turnip may naturally be expected to be found according as seasons vary.

It is right to notice here the method now used, for the reliability of the results entirely depends upon that. Owing to the

greatly increased accommodation and large apparatus provided by the Society it was possible to carry on the analysis on a large scale. Thirty bulbs (or about a fourth of the whole crop) were taken from each plot and sent to the laboratory. These were thoroughly cleaned from all adhering substances, and a section of about one-tenth of each bulb was taken and transferred in batches of ten to a large drying chamber heated by water under great pressure, and capable of maintaining a heat in the chamber above the boiling point of water. The difference of the weight of the turnip sections before and after drying gave the moisture only approximately, for even when the turnip sections had ceased losing appreciably in weight, there still remained a varying amount of moisture, which was determined when the samples were ground, and this added to the former amount gave the entire moisture in the bulbs. The amounts so obtained were checked and confirmed in various ways, so that the results might be perfectly reliable. After drying, the pieces of turnip were ground in a mill, the additional moisture was determined, and samples of the dry turnip matter thus obtained were kept for making all further analysis. Upwards of 3000 turnips have been sampled in this manner during the past season.

In the above table it will be noticed that plot 1 at Harelaw and plot 9 at Pumpherstons have yielded very small crops. The deficiency in the former case was due to accidental causes; and in the latter to a blight which occurred early in the season, and from which the plants never recovered.

Arranging the first twelve plots so as to make a comparison between dissolved and undissolved phosphates, we have the following results:—

## UNDISSOLVED PHOSPHATES.

		HARELAW (SWEDES).			PUMPHERSTON (YELLOWS).		
		Weight per acre.	Dry Matter per cent.	Dry Matter per acre.	Weight per acre.	Dry Matter per cent.	Dry Matter per acre.
1	Bone ash . . . .	cwts. 157	10·6	cwts. 16·6	cwts. 297	8·1	24·0
3	Ground coprolites . .	202	10·5	21·2	339	8·0	27·1
5	Bone meal . . . .	206	10·6	21·8	273	8·0	21·8
7	Phosphatic guano . .	223	10·7	23·8	275	8·0	22·0
9	Ground apatite . . .	177	10·4	18·4	193	7·1	13·7
11	Ground mineral phosphates . . . .	211	10·3	21·7	294	7·9	23·2
	Average . . . .	196	10·5	20·6	278	7·8	22·0

## DISSOLVED PHOSPHATES.

		HARELAW (SWEDES).			PUMPHERSTON (YELLOWS).		
		Weight per acre.	Dry Matter per cent.	Dry Matter per acre.	Weight per acre.	Dry Matter per cent.	Dry Matter per acre.
2	Bone ash . . . .	241	9.6	23.1	385	8.2	31.6
4	Ground coprolites .	202	10.4	21.0	310	8.5	26.3
6	Bone meal . . . .	246	10.1	24.8	308	8.2	25.2
8	Phosphatic guano .	257	10.2	26.2	334	8.2	27.4
10	Ground apatite . .	236	10.5	24.7	390	7.9	30.8
12	Ground mineral phosphates . . . .	228	10.0	22.8	385	8.2	31.6
	Average . . . .	235	10.1	23.8	354	8.2	28.8
	Excess of undissolved .	...	0.4	...	...	...	...
	„ dissolved . . . .	39	...	3.2	76	0.4	6.8

The increase in the crop due to the dissolving of the phosphate is, at both stations, about 20 per cent.; the percentage of dry matter varies very slightly, but the total amount of dry matter per acre is at Harelaw 15 per cent. more, and at Pumpherstons 25 per cent. more on the plots which received dissolved phosphates. This is a more marked increase than that which was obtained upon the large plots two years ago, and confirms the opinion that there is great economy in using dissolved phosphates, rather than the raw material, upon the soil of these stations.

The advantage derived from the use of dissolved phosphates is greater than appears upon the surface, for there is a certain fixed cost involved in the raising of a turnip crop whatever the manures used,—viz., rent, labour, seed, &c., and it is only after these have been deducted that the relative advantage derived from the use of various manures can be compared.

The increase of crop obtained by the use of dissolved phosphates in these experiments is seen to be due not to water chiefly but also to solid matter, and we shall now examine into the nature of the solid matter forming the increase. The constituents of the solid matter may be divided into two kinds, those useful as food, such as albuminoid matter and sugar and allied substances, and those of comparatively little feeding value, viz., woody fibre and ash. In the following table the relative proportions of these

latter substances contained in the dry matter and also the actual quantities produced per acre are arranged:—

Root Crops, 1880,— $\frac{1}{11\frac{1}{2}}$  ACRE PLOTS.

HARELAW (SWEDES).					PUMPHERSTON (YELLOWs).			
	Ash per cent.	Ash per acre.	Woody Fibre percent.	Woody Fibre per acre.	Ash percent.	Ash per acre.	Woody Fibre percent.	Woody Fibre per acre.
		lbs.		lbs.		lbs.		lbs.
1	5·8	108	11·4	212	7·1	190	10·9	293
2	5·5	142	11·9	308	7·3	258	11·7	414
3	5·1	121	10·9	259	8·0	242	11·3	342
4	5·3	124	11·8	277	7·5	221	11·8	347
5	5·1	124	10·9	266	7·8	190	10·9	266
6	5·4	149	11·1	308	7·7	217	10·6	299
7	4·9	130	10·8	288	7·8	192	11·3	278
8	5·1	149	12·1	355	7·8	240	10·9	333
9	5·0	103	10·8	222	7·8	120	11·4	174
10	5·2	143	10·5	290	7·5	259	11·3	390
11b	5·1	124	12·6	306	7·1	184	11·1	288
12b	5·4	138	13·3	339	7·8	276	10·3	353
13	5·3	141	10·6	283	7·3	221	12·6	380
14	5·3	123	11·1	258	7·9	278	11·1	391
14b	5·0	135	10·6	287	7·3	215	10·9	320
16	4·7	138	10·2	301	7·4	222	11·6	349
28	4·9	131	10·7	287	7·8	246	11·5	362
29	5·1	136	10·8	288	7·2	220	12·7	386
30	5·1	139	11·7	318	7·3	227	10·9	339

Here we may note in passing how great is the difference in the percentage of ash contained in the yellow turnips compared with that found in the swedes, the former containing half as much again as the latter. This accords with the experience noticed in the report of the former turnip crop, that the more water the bulbs contained they also contained the more ash. The percentage of woody fibre does not differ in the two kinds of turnip, and averages about 11 per cent. When the percentages of ash and woody fibre in the turnips grown with dissolved phosphates are compared with those grown with undissolved phosphates, it is found that the differences are not very great, and the amounts produced per acre were as follows:—

## HARELAW (SWEDES).

		Ash per acre.		Woody Fibre per acre.	
		Undis- solved.	Dis- solved.	Undis- solved.	Dis- solved.
1 and 2	Bone ash . . . .	lbs. 108	lbs. 142	lbs. 212	lbs. 308
3 „ 4	Ground coprolites . .	121	124	259	277
5 „ 6	Bone meal . . . .	124	149	266	308
7 „ 8	Phosphatic guano . .	130	149	288	355
9 „ 10	Ground apatite . . .	103	143	222	290
11 „ 12	Ground mineral phosphate	124	138	306	339
	Average . . . .	118	141	259	313
PUMPHERSTON (YELLOWs).					
1 and 2	Bone ash . . . .	190	258	293	414
3 „ 4	Ground coprolites . .	242	221	342	347
5 „ 6	Bone meal . . . .	190	217	266	299
7 „ 8	Phosphatic guano . .	192	240	278	333
9 „ 10	Ground apatite . . .	120	259	174	390
11 „ 12	Ground mineral phosphate	184	276	288	353
	Average . . . .	186	245	273	356

The increase per acre in the amount of ash and woody fibre produced on the dissolved phosphate plots at Harelaw is about 20 per cent. over that produced on the undissolved phosphate plots, while at Pumpherstons the increase amounts to 30 per cent. The increase at Harelaw is normal; that is to say, it is proportionate to the total increase of the crop, while that at Pumpherstons is in excess of the normal proportion.

The woody fibre was estimated in the ordinary way, which consists in treating the dry turnip matter with a boiling 5 per cent. solution of acid and alkali, and considering the insoluble residue as composed of the woody fibre and a certain amount of ashy matter, which is estimated and deducted so as to give the woody fibre proper; but though this is the recognised and generally adopted method, it is certain that it furnishes only an approximation to the true amount of indigestible woody fibre. For the purposes of comparison, however, it is quite reliable, and in the present investigation it is relative and not absolute quantities with which we are concerned. The amounts of ash and woody fibre added together give the total amount of indigestible material contained in the dry matter of the turnips, and the

remainder represents approximately that part of the dry matter which is good for food. This latter is of two kinds, nitrogenous and non-nitrogenous. The nitrogenous part consists mostly of albuminoid matter, which is a very valuable form of food, but there are also other nitrogenous compounds in the turnips which are not valuable, and unless they are separated from the dry matter before estimating the albuminoids, the feeding value of the turnips is certain to be over estimated. This has been done in the case of the quantities given below, so that they represent the *true albuminoid matter*. The non-nitrogenous constituents consists of oil, sugar, mucilage, digestible cellulose, and allied compounds, and these also are valuable feeding substances. In the following table the percentage and total product of these substances are arranged :—

ROOT CROPS, 1880,— $\frac{1}{12}$  ACRE PLOTS.

HARELAW (SWEDES).					PUMPHERSTON (YELLOWS).			
	Albuminoid Matter.		Non-nitrogenous Matter.		Albuminoid Matter.		Non-nitrogenous Matter.	
	Per cent.	Per acre.	Per cent.	Per acre.	Per cent.	Per acre.	Per cent.	Per acre.
		lbs.		cwts.		lbs.		cwts.
1	7.4	137	75.4	12.5	6.2	167	75.8	18.2
2	6.9	178	75.7	17.5	5.8	205	75.2	23.8
3	7.6	180	76.4	16.2	6.6	200	74.1	20.1
4	6.7	157	76.2	16.0	6.2	182	74.5	19.6
5	7.0	171	77.0	16.8	5.8	141	75.5	16.4
6	7.2	200	76.3	19.0	6.6	186	75.1	18.9
7	7.8	208	76.5	18.2	6.8	167	74.1	16.3
8	7.0	205	75.8	20.0	6.6	203	74.7	20.5
9	7.0	144	77.2	14.2	6.2	95	74.6	10.2
10	6.8	188	77.5	19.2	5.8	200	75.4	23.2
11b	7.0	170	75.3	16.3	5.5	143	76.3	17.7
12b	7.5	178	73.8	17.0	5.6	198	76.3	24.1
13	7.7	206	76.4	18.3	6.6	199	73.5	19.8
14	7.4	172	76.2	15.8	6.6	232	74.4	13.4
14b	7.0	190	77.4	18.8	5.7	167	76.1	20.0
16	7.0	207	78.1	20.6	6.8	205	74.2	19.4
28	7.4	199	77.0	18.5	5.5	174	75.2	21.2
29	7.0	186	77.1	18.3	6.6	201	73.5	20.0
30	7.6	206	75.6	18.4	5.7	177	76.1	21.1
Aver.	7.2	183	76.4	17.4	6.2	180	75.1	19.1

The average percentage of albuminoid matter contained in the dry matter of the swedes is seen to be about 16 per cent.

higher than that contained in the dry matter of the yellow turnips, and the percentage of non-nitrogenous food matter is just about the same in both. The ratio of nitrogenous to non-nitrogenous constituents, or what is usually called the *nutrient ratio*, is in the swedes about 1 to 10½, and in the yellows about 1 to 12. The dry matter of swedes is therefore a more valuable feeding material than that of yellow turnips, and when we consider that the proportion of dry matter contained in swedes is much greater than that contained in yellow turnips, we are led to the conclusion that 10 tons of swedes may be equal in feeding qualities to 13 tons of yellow turnips; but this is a matter which can be determined far more accurately by actual feeding experiments than by calculations derived from analysis.

Returning to the question of undissolved *versus* dissolved phosphates, we obtain the following results in regard to food material per cent. and per acre grown on the phosphate plots.

## UNDISSOLVED PHOSPHATES.

		HARELAW (SWEDES).				PUMPHERSTON (YELLOWS).			
		Albumi- noid Matter.		Non-nitro- genous Matter.		Albumi- noid Matter.		Non-nitro- genous Matter.	
		Per cent.	Per acre.	Per cent.	Per acre.	Per cent.	Per acre.	Per cent.	Per acre.
			lbs.		cwts.		lbs.		cwts.
1	Bone ash . . . .	7.4	137	75.4	12.5	6.2	167	75.8	18.2
3	Ground coprolites	7.6	180	76.4	16.2	6.6	200	74.1	20.1
5	Bone meal . . . .	7.0	171	77.0	16.8	5.8	141	75.5	16.4
7	Phosphatic guano	7.8	208	76.5	18.2	6.8	167	74.1	16.3
9	Ground apatite . .	7.0	144	77.2	14.2	6.2	95	74.6	10.2
11	Ground Curaçoa phosphate . . . .	7.0	170	75.3	16.3	5.5	143	76.3	17.7
	Average . . . .	7.3	168	76.1	15.7	6.2	152	75.1	16.5
DISSOLVED PHOSPHATES.									
2	Bone ash . . . .	6.9	178	75.7	17.5	5.8	205	75.2	23.8
4	Ground coprolites	6.7	157	76.2	16.0	6.2	182	74.5	19.6
6	Bone meal . . . .	7.2	200	76.3	19.0	6.6	186	75.1	18.9
8	Phosphatic guano	7.0	205	75.8	20.0	6.6	203	74.7	20.5
10	Ground apatite . .	6.8	188	77.5	19.2	5.8	200	75.4	23.2
12	Ground Curaçoa phosphate . . . .	7.5	178	73.8	17.0	5.6	198	76.3	24.1
	Average . . . .	7.2	184	75.9	18.1	6.1	196	75.2	21.7
	Excess of dissolved phosphates . . . .	...	16	...	2.4	...	44	...	5.2



It is evident from the above table that there is no difference in the percentage of albuminoid matter and non-nitrogenous food material in the turnips grown with dissolved and undissolved manures. There is a considerable increase of those two constituents per acre, but it is quite proportionate to the increase of the total crop in each case.

To sum up the results of these small experiments as to phosphates, it has been shown that dissolved phosphates have increased the crop of turnips on our two stations of Harelaw and Pumpherston 15 and 25 per cent. respectively, and that the increase has not been due to a disproportionate amount of water, woody fibre, ash, or other worthless constituent, but that it is due to a normal increase in all the constituents of the crop; that is to say, the quantity of the crop has been increased, but its quality has remained almost unaffected.

#### EXPERIMENTS ON THE MARQUIS OF TWEEDDALE'S HOME FARM OF YESTERMAINS.

##### *Turnip Crop, 1880.*

A very interesting and well conducted series of experiments was made this year by the Marquis of Tweeddale upon the Home Farm of Yestermains. There were six experiments, and these were duplicates of plots 3 and 4, 5 and 6, 9 and 10 of the Society's scheme, that is to say, coprolites, bones, and Canadian apatite, both in the undissolved and dissolved forms. The field selected for the experiments was well adapted for the purpose, and the experimental plots were situated in the middle of the field running from end to end, a distance of about 300 yards, and each plot covered half an acre. The appearances presented by the plots during the whole season were very striking, and the following table supplied to me by Mr Swinton, under whose superintendence the experiments were conducted, shows the details of the manuring and cropping at a glance.

RESULTS OF EXPERIMENTS WITH ARTIFICIAL MANURES, ON TURNIP CROP 1880, ON THE MARQUIS OF TWEEDDALE'S  
HOME FARM OF YESTERMAINS.

Plot.	Kinds of Manures.	Rate per cwt.			Quantity of Manure for one acre.			Value of Manures for one acre.		Weight of Turnips from one acre. (Fosteron Hybrid).		
		tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.	£	s.	d.
3	Ground coprolites, . . . . .	...	5	2	4	...	12	1	4	4	11	2
	Nitrate of soda, . . . . .	...	2	1	4	...	...	...	...	...	...	...
	Sulphate of potash, . . . . .	...	4	1	24	...	...	...	...	...	...	...
4	Ground coprolites, dissolved in sulphuric acid, . . . . .	...	5	2	4	...	...	...	...	...	...	...
	Nitrate of soda, . . . . .	...	2	1	4	...	...	...	...	...	...	...
	Muriate of potash, . . . . .	...	2	3	4	...	...	...	...	...	...	...
	Sulphuric acid, . . . . .	...	4	1	8	...	14	3	20	4	10	2
5	Bone meal, . . . . .	...	5	3	8	...	...	...	...	...	...	...
	Nitrate of soda, . . . . .	...	1	1	...	...	11	1	4	4	12	8
	Sulphate of potash, . . . . .	...	4	1	24	...	...	...	...	...	...	...
6	Bone meal dissolved in sulphuric acid, . . . . .	...	5	3	8	...	...	...	...	...	...	...
	Muriate of potash, . . . . .	...	2	3	4	...	...	...	...	...	...	...
	Nitrate of soda, . . . . .	...	1	1	...	...	12	2	...	4	7	4
	Sulphuric acid, . . . . .	...	2	3	16	...	...	...	...	20	1	...
9	Ground apatite (Canadian), . . . . .	...	3	2	24	...	...	...	...	...	...	...
	Nitrate of soda, . . . . .	...	2	1	4	...	10	1	24	4	13	2
	Sulphate of potash, . . . . .	...	4	1	24	...	...	...	...	10	...	...
10	Canadian ground apatite, dissolved in sulphuric acid, . . . . .	...	3	3	24	...	...	...	...	...	...	...
	Nitrate of soda, . . . . .	...	2	1	4	...	11	2	8	4	7	6
	Muriate of potash, . . . . .	...	2	3	4	...	...	...	...	21	13	...
	Sulphuric acid, . . . . .	...	2	3	4	...	...	...	...	...	...	...

The contrast between the plots which received dissolved phosphates and the corresponding plots which received undissolved phosphates is very striking, and far exceeds that obtained at the experimental stations of the Society. The average yield per acre with the insoluble and soluble phosphates is as follow:—

		Weight per Acre.		Average.	
		tons.	cwts.	tons.	cwts.
3	Ground coprolites . . .	17	5	14	6
5	Bone meal . . . . .	15	14		
9	Ground apatite . . . . .	10	...		
4	Dissolved coprolites . . .	22	4	21	6
6	Dissolved bones . . . . .	20	1		
10	Dissolved apatite . . . . .	21	13		

showing an increase with soluble phosphates of nearly 50 per cent. The plot with ground Canadian apatite was a failure from the beginning to the end of the season, showing that this hard crystalline phosphate is unsuited for use in the undissolved state even when very finely ground. The inequality of the crops produced with undissolved phosphates is also shown very markedly in these experiments, and confirms what was pointed out (page 352) in reference to the barley crop.

Plot.	Dry Matter per cent.		Ash per cent.		Dry Matter per Acre.		Ash in Dry Matter per Acre.	
	Clay.	Gravel.	Clay.	Gravel.	Clay.	Gravel.	Clay.	Gravel.
3	6.28	6.76	7.3	7.5	cwts. 21.6	cwts. 23.3	lbs. 170	lbs. 195
5	7.10	6.37	7.9	7.9	22.3	20.0	196	177
9	7.45	6.70	7.0	8.0	15.9	13.4	125	110
Average,	6.94	6.61	7.4	7.8	19.9	18.9	164	161
4	6.42	6.62	7.4	7.0	30.6	29.4	240	230
6	7.09	7.18	6.4	6.7	28.4	28.8	203	215
10	7.40	6.67	6.8	7.8	32.0	28.9	243	252
Average,	6.97	6.82	6.9	7.2	30.3	29.0	229	232

The field on which the experiment was made has two kinds of subsoil, one-half of the field resting on clay and the other on gravel, and the plots were so arranged that one-half of each plot was on the one kind of land and the other on the other.

Samples from each plot were sent to the laboratory for analysis, thirty turnips from clay half and thirty from the gravel half, and some of the results are contained in the preceding table.

This table shows that the turnips grown on the clay subsoil contained a greater proportion of dry matter and a less proportion of ash than those grown over the gravel. As in the experiments at the stations, the use of dissolved phosphates does not seem to have made any difference in the proportion of water or dry matter contained in the turnips. It will be noticed that the turnips on the undissolved section contain a greater proportion of ash than the others, and in this respect they differ from the other experimental crops, where an increase in the percentage of ash is constantly found to accompany the use of dissolved manures. Supposing that the weight of crop had been uniform over the whole of each plot, there would still have been a deficiency of from 3 to 5 per cent. in the amount of dry matter in that part of the plot resting on gravel. The results of these experiments, so striking and so decisive, are not only interesting in themselves, and of value as contributing to the solution of the general question regarding phosphatic manures, but they are of immediate value as indicating clearly the kind of manures most suitable for application to the turnip crop on that particular soil. This is another proof of the great benefit which would accrue to farmers if, without going out of their way, or without interfering at all with their ordinary farming practice, they would practically ask a few simple questions of their soils to guide them in the choice of their manures.

In another part of this volume are published the results of experiments made by Mr Lawson, Sanddyford. They differ almost entirely from those obtained at the Society's stations, and show that the wants of the soils of Angus are not the same as those in the Lothians or at Yester. The results of Mr Lawson's experiment ought to convey a plain, unmistakable lesson to all the farmers in the district, and they will be wise if they learn it, and still more so if they imitate it, so as to prove for themselves the accuracy of the conclusions arrived at.

There is one great fact brought out by the various experiments that are now being carried on in Scotland, and that is, that *different soils want different manures*, and that in the matter of manuring it is useless, or worse than useless, to legislate for all Scotland from the results obtained in any one part of it. If our Scottish farmers, and specially our Scottish landowners, were true to their own best interests, there would not be a county in

Scotland without a small branch experimental station, or a soil of any breadth that was not being made to tell what were its chief wants. The former need not cost more than from £50 to £100 a year, and a small five-plot test or similar inquiry need cost nothing at all; but the saving which would result from their institution would amount to many thousands annually.

#### SCHEME OF EXPERIMENTS AT THE EXPERIMENTAL AGRICULTURAL STATIONS OF THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND, COMMENCED MAY 1878.

At each station there are 10 acres under experiment, divided into 40 plots of 1 rood each. The cropping is a rotation of turnips, barley, grass, and oats. The chief object of the experiments is to determine the crop-producing value of the various forms of the most important manures. The manures on each plot contain 20 lbs. phosphoric acid, 15 lbs. potash, 5 lbs. nitrogen.

Plot.	PHOSPHATIC MANURES.			
1. Bone Ash, . . . .	with Sulphate of Potash.	Nitrate of Soda.		
2. " dissolved, . . .	Muriate	"	"	
3. Ground Coprolites, . .	Sulphate	"	"	
4. " dissolved, "	Muriate	"	"	
5. Bone Dust, . . . .	Sulphate	"	"	
6. " dissolved, . . .	Muriate	"	"	
7. Phosphatic Guano, . .	Sulphate	"	"	
8. " dissolved, "	Muriate	"	"	
9. Ground Apatite, . . .	Sulphate	"	"	
10. " dissolved, "	Muriate	"	"	
11. No Phosphates, . . .	Sulphate	"	"	
12. Bone Ash alone.				

NITROGENOUS MANURES.				
13. Nitrate of Soda, . . .	with Bone Ash.	Sulphate of Potash.		
14. Sulphate of Ammonia, . .	"	Muriate	"	
15. Shoddy, . . . .	"	Sulphate	"	
16. Dried Blood, . . . .	"	"	"	
17. No Nitrogen, . . . .	"	"	"	
18. Nitrate of Soda alone.				

*Rape Cake and Cotton Cake, see Plot 35.*

POTASH MANURES.			
19. Sulphate of Potash, . . .	with Nitrate of Soda.	Bone Ash.	
20. Muriate " . . . .	"	"	
21. No Potash, . . . .	"	"	
22. Sulphate of Potash alone.			

## GUANOS.

- |                     |  |   |
|---------------------|--|---|
| 23. Peruvian Guano, | } with Bone Ash and<br>Sulphate of Potash. | { Containing about 10 per cent.<br>Ammonia and 10 per cent.<br>soluble Phosphate. |
| 24. Fish "          |  |   |
| 25. Ichaboe "       |  |   |
| 26. Imitation "     |  |   |
| 27. Unmanured.      |  |   |

## SUPERPHOSPHATES.

- |                                    |                      |                    |
|------------------------------------|----------------------|--------------------|
| 28. 10% Soluble Phosphate of Lime. | Sulphate of Ammonia. | Muriate of Potash. |
| 29. 20% " "                        | " "                  | " "                |
| 30. 30% " "                        | " "                  | " "                |

## VARIOUS QUANTITIES.

- |  |  |
|--|--|
| 31. Same as Plot 1.                                      | { a. $\frac{2}{3}$ quantity per acre.<br>b. $1\frac{1}{3}$ " |
| 32. " " 2.   |  |
| 33. " " 14.  | { a. " "<br>b. $1\frac{1}{3}$ "                              |
| 34. " " 20.  |  |
| 35. { a. Rape Seed Dust.<br>b. Decorticated Cotton Cake. |  |
| 36. $1\frac{1}{2}$ Acre Plots.                           |  |

EXPERIMENTS ON PLOT 36, VIZ.,  $1\frac{1}{2}$  ACRE PLOTS.

## Plot.

- |                                |                          |                  |
|--------------------------------|--------------------------|------------------|
| 1. Bone Ash,                   | with Mixed Potash Salts. | Nitrate of Soda. |
| 2. " dissolved,                | "                        | "                |
| 3. Ground Coprolites,          | "                        | "                |
| 4. " dissolved,                | "                        | "                |
| 5. Bone Meal,                  | "                        | "                |
| 6. " dissolved,                | "                        | "                |
| 7. Phosphatic Guano,           | "                        | "                |
| 8. " dissolved,                | "                        | "                |
| 9. Ground Canadian Apatite,    | "                        | "                |
| 10. " dissolved,               | "                        | "                |
| 11b. Ground Curagea Phosphate, | "                        | "                |
| 12b. " dissolved,              | "                        | "                |
| 13. Superphosphate,            | "                        | "                |
| 14. " "                        | Sulphate of Ammonia.     | "                |
| 14b. " "                       | Muriate of Potash.       | "                |
| 16. " "                        | Mixed Potash Salts.      | Dried Blood.     |
| 28. " 10% soluble,             | "                        | Nitrate of Soda. |
| 29. " 20% " "                  | "                        | "                |
| 30. " 30% " "                  | "                        | "                |

THE CEREAL AND OTHER CROPS OF SCOTLAND FOR 1880, AND  
METEOROLOGY OF THE YEAR RELATIVE THERETO.

## THE CROPS.

THE following comparison of the cereal and other crops of 1880 with the previous year, has been prepared by the Secretary of the Society from answers to queries sent to eminent agriculturists in different parts of the country.

The meteorology of the year has been furnished by Mr Alexander Buchan, Secretary of the Meteorological Society of Scotland.

The queries issued by the Secretary were in the following terms :—

1. What was the quantity, per imperial acre, and quality of grain and straw, as compared with last year, of the following crops? The quantity of each crop to be stated in bushels. What quantity of seed is generally sown per acre?—(1) Wheat, (2) Barley, (3) Oats.
2. Did the harvest begin at the usual time, or did it begin before or after the usual time? and if so, how long?
3. What was the quantity, per imperial acre, and quality of the hay crop, as compared with last year, both as regards rye-grass and clover respectively? The quantity to be stated in tons and cwts.
4. Was the meadow hay crop more or less productive than last year?
5. What was the yield of the potato crop, per imperial acre, as compared with last year? Was there any disease, and if so, to what extent, and when did it commence? The quantity to be stated in tons and cwts.
6. What was the weight of the turnip crop, per imperial acre, and the quality, as compared with last year? How did the crop braird? Was more than one sowing required? and why? The weight of the turnip crop to be stated in tons and cwts.
7. Were the crops injured by insects? Was the damage greater or less than usual? State the kinds of insects.
8. Were the crops injured by weeds? Was the damage greater or less than usual? State the kinds of weeds?
9. Were the pastures during the season of average growth and quality with last year?
10. How did stock thrive on them?
11. Have cattle and sheep been free from disease?
12. What was the quality of the clip of wool, and was it over or under the average?

From the answers received, the following statistics have been compiled :—

**EDINBURGSHIRE.**—The quantity of wheat about 40 per cent. better than last year, the quality also very superior. The yield may be about 44 bushels. The straw is also better, but not so much as the grain. The quantity of barley about 30 per cent. better, and quality also very much better, the straw also better. The quantity of grain 50 bushels. The quantity of oats much the same, but the weight 2 lbs. per bushel heavier. The straw less in quantity, but the quality better. Quantity of grain about 60 bushels. Harvest began on the 20th August, being about the usual time on an average of years. Quantity of hay under average very much, say 2 tons where 3 tons should be grown, quality superior; meadow hay also under average. Yield of potato crop much above average, but from a third to a fourth of diseased tubers. Total quantity in many cases might reach 8 to 10 tons—quality good. Turnip crop large compared with last year, and much above average; 30 tons in some cases might be reached; quality good, but now greatly destroyed with frost where exposed; one sowing only required. Very little damage from insects. Weeds not bad. Pastures fair average, and much better feeding. Stock did well. One of the healthiest seasons we have had for a long time. The clip of wool was a fair average.

**LINLITHGOWSHIRE.**—Wheat generally a good crop, from 4½ to 5 quarters; weight generally good; plenty of straw. Barley good on soft land, light and very variable on stiff soils—from 3 to 5 quarters. Oats same as barley, from 5 to 5½ quarters. Harvest about a fortnight earlier than usual in the low districts, and about a month in the high. Hay a very light crop, say 1½ tons; a want of clover generally. Crop well got, but not good in quality. No meadow hay. Potatoes good crop generally, from 6½ to 8 tons; not much disease; was late in making its appearance. Turnip crop from 20 to 30, and in some cases nearly 40, tons; late in brairding; little if any second sowing required. Few or no insects. No weeds. Pastures bad in the beginning of the year, good towards the end. Stock thriving, and free from disease. Clip of wool about an average.

**HADDINGTONSHIRE (Upper District).**—Wheat very little grown. Barley—32 bushels, of middling quality; straw about average; seed, 4 bushels. Oats—52 bushels, of good quality; straw above average; seed, 5 bushels. Harvest three weeks earlier than last year, but about a fortnight behind average. Hay an average crop, and of fair quality; 2 tons 10 cwt. Meadow hay—crop above average, but not very well secured. Potatoes a fair crop, but from a third to a half diseased, which did not show till September. The crop averages about 5 tons. Turnips a large crop and of excellent quality, till much destroyed by frost in January. There was a good baird, and very little re-sowing necessary. Weight of crop—Swedes, 16 to 20 tons; Yellow, 16 to 25 tons. None of the crops injured by insects. Fallows generally were dirty, but the full crop of turnips corrected this. Pastures about an average, and better feeding quality. Stock thrived fairly well, and were entirely free from disease. Clip of wool an average.

**BERWICKSHIRE.**—Wheat—quantity, 1879, 30 bushels; 1880, 32 bushels; seed about 3 bushels. Barley, 1879, 21 bushels; 1880, 27 bushels; seed about 3 bushels. Oats, 36 bushels in 1879, 40 bushels in 1880; seed about 3 bushels. The quality of the grain and straw of the above crops in 1880 was much better than in 1879. Harvest began about a week later than the usual time. Hay crop quantity in 1879, 1 ton; in 1880, 1½ ton, of average quality. Clover rather better than the rye-grass. There is very little meadow hay grown. Potatoes—yield in 1879, 3 tons; in 1880, 7 tons.



There was a good deal of disease, about one-half of crop in case of Regents being affected, but Champions and Reds not so much; disease was first observed about the end of September. Turnips—weight in 1879, 7 tons; in 1880, 20 tons; quality much above last year; crop braided well; there was only one sowing required. None of the crops injured by insects. No weeds. Pastures much better than in 1879; in 1879 they did not feed well. Stock thrived well, and were free from disease. Clip of wool good, over the average.

ROXBURGHSHIRE.—No wheat. Barley, 30 bushels; weight, per bushel, 2 lbs. more than last year's crop. Colour of grain darker; straw, worse quality;  $2\frac{1}{2}$  bushels sown. Wet weather during harvest injured the quality of both grain and straw. Oats, 42 bushels; weight, 4 lbs. more than last year; colour much the same, and straw not so good as last year's crop. Harvest began about usual time. No meadow hay. Potatoes looked like being a crop of about 8 or 9 tons, but from the early frost, before crop could be lifted the bulk is reduced to little more than the half. There was not much disease. Potatoes grown nearly all Champions and Rocks. Turnip crops braided well, but have been much injured with finger and toe, and latterly by the severe weather. No injury to the crops from insects. Weeds not so injurious as last year. Up to Whitsunday pastures were deficient, after that the grass came on pretty well, but at no time was it abundant. Stock thrived well, and were free from disease. Wool of ewes weighed better than the previous year, that of hogs much the same as in former years.

SELKIRKSHIRE.—Wheat—almost none grown. No barley. Oats a full average. Crop of grain of fine quality; 40 bushels; but under an average of straw owing to the dry weather during the early part of the season; from 4 to 6 bushels is generally sown. The harvest began the third week of August, as near as possible the usual time. The hay crop was rather under an average, with almost no clover; very few crops would exceed 2 tons, and many would not reach that quantity. Meadow hay was also deficient, owing also to the dry weather early in the season; and on hills where hay is generally made, the quantity was very small. The yield of the potato crop was much superior to last year, with fine quality; there were, however, more small potatoes than usual; disease would appear on about one-third of the crop, which would be 20 tons. The turnip crop was most excellent, and fine quality. The crop braided well, and required no re-sowing. The crop would weigh 20 to 25 tons. No damage by insects or weeds. The pastures were of average growth, and quite superior in quality to last year. On gravelly soils this crop suffered considerably from drought. Stock thrived well, and were entirely free from disease. Wool—a full average clip, and of fine quality.

PREEBLESIRE.—No wheat or barley. Oats about 38 bushels, or about 8 bushels more than last year. The quality of grain and straw was very much better in 1880 than the year previous. About 4 bushels sown. Harvest began on 20th August, a month earlier than in 1879, or ten or twelve days before the average of the last twenty years; finished harvest on 9th September, the earliest finish on record for twenty years, excepting the harvest of 1868. The clover and rye-grass hay crop was lighter in 1880 than in the previous year, but very much better in quality; from 25 cwt. to 30 cwt. will be something like the quantity. Meadow hay more productive and better in quality. Potatoes would be from 4 to 5 tons more than the previous year (1879), or probably 10 to 12 tons in full; three-fourths of the crop diseased. Disease first noticeable in the first week of September by spotting of the shaws. Turnips from 15 to 25 tons, or 10 tons more than last year; did not braid well on heavy land, and

had to be re-sown owing to dry weather; light land and early sown turnips did best. Crops not much injured by insects. Turnips slightly with fly. Oats—by wire worm, but slight, less than usual. Weeds less than usual. Pastures scarcely so rough, but much better quality. Stock did well, and killed better than previous year. Cattle and sheep were entirely free from disease. Wool better in quality than usual, and considerably over an average as regards weight.

KIRKCUDBRIGHTSHIRE.—Wheat little grown; what there was, above average quality; straw somewhat less. Barley—better than last year, about average, quality good; less straw. Oats—quality above last year, below average in quantity, above in quality; straw short but good. Harvest about two weeks before usual time. Hay and meadow hay much better than last year, about an average crop; quality good. Potatoes about double the quantity of last year; little disease; no disease appeared till after the harvest. Turnips—quantity fully 10 tons above last year, braided well, little or no re-sowing, quality very good. Insects—nothing of any consequence, very little fly. No weeds. Pastures very much better than last year, quality very good, stock thrived unusually well, and almost entirely free from disease. Wool clip—quality good, over average.

WIGTOWNSHIRE.—Wheat—25 bushels in 1880, 20 bushels in 1879; quality much better in 1880; about 3 bushels of seed. Barley—32 bushels of 56 lbs. quality in 1880; quality in 1879 about 50 lbs.,  $3\frac{1}{2}$  bushels of seed. Oats—32 bushels of 42 lbs. weight, and a good crop of straw; in 1879 the quality was about 38 lbs., and straw abundant but poor; quantity of seed  $4\frac{1}{2}$  bushels. Harvest commenced about the usual time. Hay—1 ton in 1880 and 1879, but quality much better in 1880; both rye-grass and clover good. Meadow hay less in quantity, but better in quality. Potatoes—in 1880, 8 tons; disease about one-tenth; it appeared about 1st September. In 1879, 6 tons; quality poor. Turnips—16 to 20 tons; quality good, braided well, only one sowing; in 1879 about the same weight; but worse quality. The last crop promised exceedingly well up to the beginning of August, when a long drought began; mildew set in, and the growth was checked. There was severe frost for a few nights late in October, and there was little or no increase of weight after that. No insects and no weeds. Pastures good till August, suffered from drought afterwards. In 1879 grass was plentiful, but poor in quality. Stock thrived fairly, and there was no disease. Wool clip of good quality, fully average of good years.

AYRSHIRE.—Wheat—26 to 28 bushels in 1879; 38 to 40 bushels in 1880; quality of both grain and straw greatly superior in 1880; seed about 3 bushels. Barley—24 to 28 bushels in 1879; 40 to 48 bushels in 1880; quality of grain and straw greatly superior in 1880; seed about 3 bushels. Oats—32 to 42 bushels in 1879; 48 to 60 in 1880; quality of grain and straw very superior; straw short on light lands of lower districts, but very bulky in the uplands. Harvest two weeks earlier than average. Hay deficient on fine low lands, about one ton; quality fine; quantity nearly average in uplands, and quality fine. Meadow hay less productive, quality excellent. Potatoes—7 to 10 tons on fine land in 1880, secondary land not far behind; nearly as much weight on fine land in 1879, but heavier soils did not yield half crops; little disease in 1880, began about first week of August; considerable loss by frost in October on the late crop. Turnips—20 to 28 tons in 1880, being double the weight of previous season; quality rather better also; crop braided well, generally one sowing; growth was rapid. Little damage by insects, less than usual. Weeds gave comparatively little trouble. Pastures—slow growth, but quality fine. Stock generally did well, and there was very little disease. Clip of wool good, and over an average.

**BUTE.**—Little wheat grown, only 1 plot of 4 acres in 1880; produce 30 bushels, with a fair average bulk of straw; as it was white wheat spring sown, the warm summer of 1880 made a fair crop; 4 bushels sown. • Barley largely sown after turnips and potatoes, as well as often after three years' grass; crop of 1880 about 40 bushels; and 55 lbs. per bushel; good bulk of straw and a fine crop from the warm dry season; from 3 to 4 bushels sown. Oats about 36 bushels, with rather under the usual bulk of straw; quality fine, about 42 lbs. per bushel; from 5 to 6 bushels sown. Harvest began about ten days earlier than average years, and crop secured all in fine order in about three weeks. Hay crop light. Rye-grass and clover about same as to growth; perennial rye-grass grows well; clover after hay, quantity about 1 ton 8 cwt., of fine quality. Meadow hay crop more bulky, and of better quality than last year. Potato crop finer in all respects than last year; little disease till October, about four-fifths of crop free of disease, about 10 tons in general crop, and about 5 tons in green sale crop, which latter annually occupies about half the potato land. Turnip crop was good compared with 1879, both in quantity and quality; no second sowing; the average would be 20 tons. At date of this report, 17th February 1881, from keen frost of last six weeks; yellow varieties much injured, swedes partially; crop not covered or stored as it ought to be. No particular injury done to either cereal or root crops in 1880 by insects. Crops generally clean from want of rain and fine weather for weeding. Pastures less growth up till September; quality good. Sheep thrive well on high lands. Cattle were short of grass early part of season, but did fairly well; free from disease. Wool was fair in quality, but not over average in bulk.

**ARRAN.**—No wheat. Not much barley grown—about 40 bushels; quality good, much better than last year; about 4 bushels sown. Oats from 32 to 50 bushels. Grain plump and heavy; quality better than last year; straw good, but not so bulky as last year from 4 to 6 bushels sown. Harvest ten days earlier than usual, and about six weeks earlier than last year. Hay from 1 ton to 1½ ton; quality good, but not so bulky as last year. Clover a good crop. Meadow hay rather under last year, quality good. Accounts various as to potato crop:—Shiskine district, 6 tons, quality good, little disease; Southend, 8 tons, fully half of crop diseased; Lamash, 7½ tons crop good, about one-tenth diseased, Champions from 10 to 12 tons, little disease. Turnips about 18 to 20 tons, quality good, braided well, a little finger and toe. Grub worms unusually numerous, but did little damage to crops. No injury by weeds. Pastures under an average of growth, but good quality. Stock thrived very well, much better than last year, although some complaints owing to dry season. Cattle very free from disease; in some places sheep affected by braxy and rot. Clip of wool quality good, quantity about ¼ lb. better than last year.

**LANARKSHIRE (Upper Ward).**—No wheat. Barley from 30 to 38 bushels, average 35; grain very superior in quality to last year; straw short; seed sown, 3½ bushels. Oats from 30 to 48 bushels, average 36; grain better quality, but no more bushels; straw deficient, especially after green crop; seed, 4½ bushels. Early harvest, a month earlier than last year. Hay—average 16 cwt., only half a crop owing to drought, but well got. Meadow hay average crop, well got, where not watered under average. Average 6 tons of good potatoes where sorted at harvest; last year 4 tons; more disease this year, and several places crop spoiled by frost before lifting. Turnips 20 tons, average last year 10 tons, good braided. Very little injury by insects. Oat crop greatly spoiled by wild mustard; other weeds easily kept down among green crops. Pastures bare, but average quality for feeding. Stock thrived fairly well, very free from disease. Clip of wool an average.

LANARKSHIRE (Middle Ward).—Wheat about 40 bushels, weighing 61 lbs. per bushel, straw being better than last year; seed sown from  $3\frac{1}{2}$  bushels to 4 bushels. Barley very little sown, that which is sown being generally consumed by hares and rabbits. Oats in some places on the banks of the Clyde, the average might be 48 bushels, but on the whole 36 bushels would be nearer the mark; seed sown in low districts 4 bushels, in high districts 5 bushels; in low districts straw was short, while in parishes of Shotts, Avondale, and East Kilbride, it was uncommonly good. Harvest begun about the 18th August, earlier than usual, and most of the white crop was in stackyard by 10th September, well got. Rye-grass about 1 ton, a very poor crop. Clover a very indifferent crop. Very little meadow hay grown; in Avondale, Lesmahagow, and Shotts, the crop was better than last year. Potato crop was good, but disease set in very early, and frost was very severe on 20th October when a great many potatoes were still unlifted; 8 tons would be a fair average, but through frost and disease one-half would be rendered useless. Turnip crop good, about 25 tons average; quality good, better than last year; crop braided fairly, no second sowing required. No crop except the bean crop was injured by insects, grub being the supposed cause. No weeds. Pastures were an average, but at same time in low lands the dry season burned them up; but in the high districts—Lesmahagow, East Kilbride, Avondale, and Shotts—they were very good. Feeding stock did well. Dairy Stock, however, did not give the same amount of (milk and butter) produce as former years. Cattle and sheep entirely free from disease. Clip of wool rather above the average.

LANARKSHIRE (Lower Ward).—Wheat—40 bushels; quality better than last year, and about 4 lbs. per bushel more weight; straw good, but 50 stones less; seed sown,  $3\frac{1}{2}$  bushels. Oats—60 bushels; quality much better than last year, and 3 lbs. per bushel more weight; straw fine quality, but a half less quantity than last year; seed sown,  $5\frac{1}{2}$  bushels. Harvest about three weeks before the usual time. Hay in quantity half a ton less, but quality good; 1 ton 10 cwt. Meadow hay, 10 cwt., less than last year. Potato crop about 2 tons more, or as 8 to 10 tons. Almost no disease, but owing to early frost a large quantity rendered useless. Turnips about 18 tons, better in quality, very irregular, several sowings, want of rain; for about three months no rain. No insects or weeds. Pastures—growth much less, but quality better than last year. Stock thrived very well where the number was few to the extent of land. Very free from disease. Clip of wool good, and over average.

RENFREWSHIRE (Lower Ward).—Barley was of good quality, both as regards grain and straw, and quite up to the average. The crop of oats was not more than average in quantity, from 6 to 7 bolls; but the quality, both of the grain and straw, was much superior to that of 1879. The harvest commenced at the end of August, and was rapidly secured, all being in by the middle of September. The crop of rye-grass hay was less in quantity than the previous year, the yield being on the average not more than a ton. The quality was superior to the previous year. Clover is not grown. Meadow hay was an average crop and of good quality. The yield of potatoes would average from 7 to 8 tons in the district of Inverkip. In the upper district of the Lower Ward, where the dry weather had more effect in retarding the growth, the crop was not so bulky, but the general average yield would be double that of the previous crop. The crop too being to a large extent Champions, the yield was larger in proportion than would have been the case had the other classes of potatoes been as widely sown as in former years. Disease showed itself in Regents and early sorts before they were lifted in the latter end of the season, but Champions withstood the disease. The turnip crop was very good, and the average weight would be from 20 to 25 tons and the quality good. No

comparison can be made with the crop of 1879, which was a failure. No damage by insects. Wire worm appeared slightly, but was not general. No weeds, but those indigenous to the soil, which were less abundant in 1879, but observable where not kept under. Pastures were deficient, arising from the dry weather. The growth of 1879 was much more abundant, but the feeding properties were destroyed from continuous rain and no sun, whereas in 1880 the pastures, while the quality of grass was good, were stunted in growth. Stock thrived well, but suffered from scarcity of water. Cattle and sheep generally free from disease. At one farm in the Kilmalecolm district pleuro-pneumonia appeared, which was promptly dealt with. The sheep are few in number, except on some of the high grounds, where the clip was an average.

ARGYLLSHIRE (Parishes attached to the district of Oban).—No wheat or barley grown; and the little bere that is grown was of good quality both seasons; yield about 10 returns. Oats very good, and exceeded that of 1879 by 10 per cent. Quality of grain and straw excellent owing to the dry season. Seed sown,  $5\frac{1}{2}$  bushels; yield, about 30 bushels. The harvest began a month earlier than in the previous season. Shearing of oats commenced at Bonaw on 19th August. Rye-grass generally lighter than crop of 1879, owing to the very dry weather in May. Quality very good, and secured in beautiful order; yield about 24 cwt. The meadow hay was about equal in quantity with that of 1879, but superior in quality, and saved in the best of order. In wet seasons sprits (*Juncus articulatus*) abound in soft ground, but last season there were scarcely any to be seen. The result was, quantity less, quality much better. Potato crop was excellent, the yield being about 16 tons, which was 30 per cent. above the previous year's crop; very little disease; commenced slightly in the first week of September. In low-lying grounds 10 per cent. of the crop was affected, but in higher and well-aired localities not more than 5 per cent. suffered, and in some farms there was scarcely any at all. Skerrie Blues escaped entirely, but the yield was less than in the white kinds. The turnip crop braided thinly owing to the dry weather, but, after coming into the rough leaf, made rapid progress. The yield was about 20 tons, and was about 50 per cent. beyond the crop of 1879. No insects, except turnip beetle to a very small extent. Fewer weeds than usual. Pastures of average growth and quality. Stock did remarkably well. Lambs were numerous, healthy, and strong. The return to the Board of Trade will show that the increase in the number of lambs was as follows:—Number of sheep of all kinds, one year old and above, in 1879, 154,359; in 1880, 160,597; increase, 6238. Lambs under one year old, in 1879, 56,378; in 1880, 64,006; increase, 7628. Cattle and sheep free from disease. The quality of the wool was excellent, and the quantity was above the average, and exceeded that of the previous year by 15 per cent. This was owing to the dry summer and the very mild winter and spring which preceded.

ARGYLLSHIRE (Parishes attached to district of Lochgilphead).—No wheat grown. Scarcely any barley grown. The oat crop was generally a good one; return from 24 to 48 bushels according to land, average nearly 12 bushels more than last year. Straw much the same in quantity, but much better in quality; 5 to 6 bushels seed sown. Harvest began fully ten days before the usual time, and the crop was saved with very little labour. Rye-grass and clover grown together,  $1\frac{1}{2}$  to  $1\frac{1}{2}$  tons; good, and got in fine order, much better than last year. The season was rather too fine and dry for meadows, and the hay crop was under the average in quantity, but above it in quality. Potato crop, 6 to 8 tons, compared with 5 to 6. Not much disease; appeared in August. Turnip crop—quality good; weight much the same as last year. No insects. Fewer weeds owing to fine season.

Pastures—growth less, quality better. Stock did well, and were quite free from disease until braxy came on. It has been very heavy during the last three months. Clip of wool much about the average.

ARGYLLSHIRE (Parishes attached to district of Dunoon).—No wheat sown. Barley—36 bushels, as against about 30 last year. The straw this year was excellent, while last year it was all but worthless. Seed sown, 4 bushels. Oats—40 bushels, as against about 25 last year, while the quality of both grain and straw was excellent. Last year straw was almost worthless, and the grain, while poor in quality, would not weigh above 37 lbs., against generally 42 lbs. this year. Quantity of seed about 5 bushels. Harvest commenced about one month earlier than usual, and seven weeks before 1874. Hay crop about 15 cwt. against 30 cwt. last year, but the quality this year is very good, against very inferior last year. Meadow hay about the same, but the quality this year is very superior. Potato crop from 8 to 10 tons; last year would not exceed 5 tons. Disease not general this year, but in some cases there would be 20 per cent.; commenced about 1st August. Turnips an average crop, about 20 tons, and last year about 15 tons; quality was deficient last year, and feeding stock did little good on them; this year about 30 per cent. has been lost by frost; braided well; did not need second sowing. No insects. Crops were never easier managed in respect of weeds. Have seen pastures much better, but stock did very well on the lesser quantity. Stock did very well, and more especially sheep. Have not heard of single case of disease in district. Clip of wool over an average, and the quality was never better.

ARGYLLSHIRE (Islands of Islay, Jura, and Colonsay).—No wheat or barley sown. Oats are thrashing about 50 bushels; a fine quality; 41 to 42 lbs. per bushel, and well coloured; about 6 bushels sown. The straw is much better than the former year, and also the oats 4 lbs. a bushel heavier and much better coloured. Harvest began on the 18th August, and finished on the 19th September. Good weather all through, although there was some rain. In 1879 harvest began on 8th of September. Hay was a very light crop in 1880, not over  $1\frac{1}{2}$  ton; double the quantity in 1879. May 1880 was very dry. Meadow hay more productive and much better in quality. Potatoes—quantity more than double 1879. No disease. Champions and Magnum Bonums sown. Turnips—an excellent crop both this year and last year. They would be rather better this year. They braided well; only sown once. A good part of the oats was thinned by the grub worm, and 2 acres of mangolds were eaten by a small fly like a clock just as they came through the ground. Kail and cabbage planted in their place, and did well. The crops were in no way injured by weeds. The summer being drier, the pastures were much superior than the former year. Stock of all kinds did much better in 1880 than in 1879, and the cows milked much better. Stock thrived well. Cattle quite free from disease, but not the sheep. The quality of the wool was good, and about an average.

ARGYLLSHIRE (District of Inveraray).—No wheat or barley. Oats about 24 or 26 bushels; average produce. Grain and straw very good and well saved; about one-third better than previous year. The usual allowance of seed is 6 bushels. Harvest began about fourteen days before the previous year. Rye-grass and clover lighter than crop of 1879 by at least 8 cwt. Meadow hay, which is the principal fodder, nearly as heavy as previous year, particularly what was late of being cut; quality of all very good. Potato crop better than previous year. Not much disease; not more than one bag in fifteen. Turnip crop always good, this year unusually so; probably 20 or 22 tons. Braided well; no second sowing required. No insects.

The season being generally dry not much weeds; dockens the most common, also thistles, which seem to thrive best in dry seasons. The pastures were not so long as last year, but quite as nourishing, and stock thrived well and were free from disease. Wool of 1880 good; above average.

**DUMBARTONSHIRE.**—Wheat about 32 bushels; quality both of grain and straw very superior to 1879. This is not a barley growing district, what is grown was of excellent quality. Oats not quite so large a crop as 1879 owing to the very dry season; straw especially was a lighter crop, but quality was never surpassed either in grain or straw; quantity varied according to land being adapted for standing excessive drought, from 40 to 50 bushels being the rule. Harvest commenced about a month earlier than 1879, and 10 to 14 days earlier than an average season. Rye-grass owing to dry season much lighter than 1879, averaging only 1 ton to 1 ton 6 cwt., or 12 to 14 cwt. less than 1879; quality good owing to dry harvesting. Clover both in rye-grass hay and in after-math wonderfully fine crop, quite exceptional; in many places the abundance of after-math cut and secured compensated fully for short first crop. Meadows only common in the western parishes of Arrochar, Luss, portion of Row, and Kilmaronock; quantity about same as last year, but quality very much better as hay harvest in 1879, for late hay was very disastrous owing to constant rain. Potato crop—quantity in 1880 averaged 10 tons, and in 1879 about 4 or 5 tons; quality in 1880 very superior; the best potato year for long. No disease till September when it appeared pretty suddenly, and was pretty severe in many instances. Turnips most abundant crop, of fine quality, about 25 tons; 1879 not more than one half; braided irregularly in 1880 owing to ground being so dry, but blanks filled when occasional showers germinated the seed, and second sowing quite exceptional. No damage from insects. Weeds less than usual, owing to dry season. Pastures vary according to soil and district; hill pasture much better than 1879 and above average; low ground owing to dry weather not so abundant, but fair average. Hill stock did particularly well; in enclosed fields on low grounds fairly well. Cattle and sheep free from disease. Clip of wool good, over the average.

**STIRLINGSHIRE (Western District).**—Wheat, none grown. Barley little grown. Oats, 1879, average would be about 28 bushels, and 35 cwt. straw, all of inferior quality owing to the late wet season; 1880, 45 bushels oats, and 40 cwt. straw, all of good quality and secured in fine condition; quantity of seed sown about 5 bushels. Harvest of 1879 about a month later than usual, 1880 a fortnight earlier than usual. Hay, 1879, average crop about 30 cwt. of inferior quality and badly secured; 1880, average crop, about 25 cwt. of small growth but finely secured. Meadow hay not quite so productive as in 1879, but of superior quality and well secured. Potato crop, 1879, average yield would be about 4 tons and in 1880 9 tons. Where the crop was allowed to stand till the ordinary digging time there would be about one-fourth diseased; the disease made its appearance about the end of August. Turnip crop, 1879, average would be about 6 tons of inferior quality, and in 1880 about 20 tons of splendid quality; braird excellent. No insects. Owing to the fine season the ground was got well cleaned and prepared, and there was no damage from weeds. Pastures shorter in growth, but of excellent quality. Stock thrived very well. Cattle and sheep free from disease, except a little scab amongst sheep. Wool—good quality and rather over average clip.

**STIRLINGSHIRE (Eastern District).**—Wheat crop 1879, was only half the average generally speaking, and 40 bushels is considered a good average, and the quality was equally low; the bulk of straw was not so deficient.

Crop 1880 was above the average, and quality excellent, grain and straw ; quantity of seed from  $2\frac{1}{2}$  to 3 bushels. Barley crop 1879, the same remarks apply ; 50 bushels is a good average. Crop 1880, not more than an average, a large area being very late in ripening owing to dry weather after seed time ; seed about 3 bushels. Oats were not so bad in 1879 ; a good average is 48 bushels ; seed about 4 bushels. Crop 1880, a good average and fine quality. The harvest of 1879 was late, that of 1880 early ; on many farms it was finished about same date as it had began the previous year, but some barley fields were very late in the Carse district ; generally speaking, however, the harvest of 1880 was about a month earlier than that of 1879, with the exception of the late barley. Hay, 1879 ; a fair crop, as to both rye-grass and clover, 35 cwt. Crop 1880 very deficient in quantity ; quality good, 20 cwt. No meadow hay. Potato crop 1879, 4 tons ; 1880, 9 tons, little or no disease. Turnips 1879, a poorish crop, 14 tons ; 1880, good—20 tons. In the Carse braird was slow, but only one sowing was required. No insects during these two years. In 1879 a lot of weeds came up,—chickweed, redshanks, tussilago, and the usual kinds that plague farmers. In 1880 weeds were not bad, being a dry year. In 1879 there was little substance in the pastures ; in 1880 pastures were good and nutritive. In 1879 stock did little good on them, in 1880 they did well. Cattle and sheep free from disease. No wool.

**FIFESHIRE (West and Middle District).**—Wheat—except on some of the thin light soils, where owing to the dry season straw was deficient, this crop has been above average, and thrashing has confirmed the favourable estimate formed early in the season ; quality superior and weights per bushel heavy. Barley on thrashing has in many cases been disappointing, and the yield will probably scarcely reach an average ; the quality generally fine, and weights heavy, although in many cases there has been a want of the fine bright colour prized by maltsters. Oats, probably a full average. On dry light soils the straw was deficient owing to the heat and drought, but the yield generally, and quality and weight of grain, satisfactory. The straw of all the corn crops superior in quality. Harvest about a week before the average time, and fully a month before 1879. Hay crop scarcely average, quality superior ; second crop in many cases very deficient. Meadow hay not much grown. As compared with last year the potato crop was probably more than double, and decidedly above average. A good deal of disease in many cases, and many complaints of "black spots" unusually early in the season, and also of "sprain" on some light lands especially ; a considerable proportion will be used in starch manufacture and for feeding cattle. Turnips generally a large crop, few bad fields to be seen ; not many cases of second sowing required. Those fields which had not been stored, have been completely destroyed by the intense frost which has prevailed. Damage by insects less than usual. The dry season was favourable for extirpating weeds. Pastures fair average and good quality. Stock thrived fairly well. There has been comparatively little disease. Clip of wool probably about average.

**FIFESHIRE (Eastern District).**—Wheat crop of 1880 at least double 1879 ; little difference in straw. Crop 1880 estimated at 26 bushels ; 3 bushels sown. Barley crop of 1880 more than double 1879 ; straw crop of 1880 not so bulky, but better quality ; 36 bushels estimated as the average of crop 1880, 3 bushels sown. Oat crop of 1880 about the same as crop 1879 ; the straw not so bulky but better quality ; estimated crop 44 bushels ; 4 bushels sown. Harvest began at the usual time. Hay crop of 1880 one-third less than 1879 ; quality much better. Crop estimated at  $1\frac{1}{2}$  ton. Meadow hay not grown. Potato crop 1880 double 1879 at least, one-fourth diseased ; disease commenced about middle of September. Turnip crop 1880 about three times larger than 1879 ; crop braided well, almost no re-sowing ; 10



tons. No insects. Barley and oats suffered to a small extent by wild mustard or skellock; the damage was less than usual. The pastures were of average growth and much better quality than the year previous. Stock thrived well, and were free from disease. Clip of wool an average.

**PERTSHIRE (South-West).**—Wheat about 40 bushels, or more than double the yield of former year. Seed sown for fallow crop 3 bushels, and after green crop 4 bushels. Barley—about 36 bushels; quality good, but samples generally dark and ill-coloured; straw one-fourth less than 1879; seed 4 bushels. Oats—40 bushels; straw not nearly so bulky as in 1879, one-third less at least. Harvest commenced about a fortnight sooner than usual, and three weeks earlier than the previous year. The quantity of hay varied very much, owing to the long periods of excessive drought, and the want of rain in spring. The crop was generally light, not nearly an average, about 26 cwt.; but good quality. River-side meadows were very productive, while upland park hay was very deficient; but all was of good quality and well got. The potato crop would average 7 tons; but on many farms one-half was lost by disease, and on others less. The disease commenced rather later than usual, and was very virulent. Turnip crop about 20 tons, or twice as much as compared with former year. Crop braided well, very little double sowing required. Quality good. Not more insects than usual; hardly any cases of damage by the beetle. The season was favourable for keeping down weeds. On all deep lands pastures were better than last year; but light soils and old fogged worn out pastures were unproductive, and in many cases burnt severely by the sun. Stock thrived very well on good deep land; but cattle were disturbed a good deal in hot weather by the gad-fly, and the sheep suffered from fly-blows and maggots. The ordinary diseases, that is, staggers and braxy, were severe on some farms; never had so many cases of sturdy. Wool was a fair good clip on hill and dale, and over an average in quantity and quality.

**PERTSHIRE (Coupar-Angus District).**—Wheat—quantity fully an average both of grain and straw; quality very good, superior to last year; not much wheat threshed yet; from 3 to 4 bushels sown. Barley from 40 to 48 bushels; quality good, and from 20 to 30 bushels more than last year; from 3 to 4 bushels sown. Oats from 48 to 58 bushels; quality very good; straw generally less than last year; about 4 bushels sown. Harvest commenced 18th August, exactly thirty days before last year, and much about the average time of the previous years. Hay very inferior as to quantity. Potato crop was very varied, even on the same farm. The crop was not larger than last year in general, there being also nearly one-half in Regents and Victorias diseased—not much in Champions or Magnum Bonums; quantity from 5 to 8 tons. Turnips from 16 to 20 tons; quality frequently not so good as last year from finger and toe; the crop braided well, and very little re-sowing was required, and there were from 6 to 8 tons more than last year. No injury by insects, and none from weeds. Pastures not nearly so good as last year on account of the continuance of dry weather. Stock thrived only middling, but were free from disease. Clip of wool an average.

**PERTSHIRE (Western District).**—No wheat, and hardly any barley. Oats an average crop. Harvest fully earlier than usual. Hay crop light; quality good; not much rye-grass. Meadow hay less productive. Potato crop good and bulky, but much diseased; a good deal lost by frost. Turnip crop heavy—sown once. No insects and no weeds. Pastures fully better than last year. Stock did better than average seasons, and were free from disease. Clip of wool superior—above average as to quantity and quality.

**PERTSHIRE (Perth District).**—Wheat from  $4\frac{1}{2}$  to 5 quarters on an average, being about 2 quarters more than last year; straw much firmer, but no more bulk than previous year; quality of grain very much better. Barley a very disappointing yield compared with what the fine dry season led us to expect—about 32 bushels, very fine quality, 55 to 57 lbs. per bushel; straw soft, and goes fast out of sight in the courts; grain better quality, but not much more of it than last year. Oats a very good crop, except on clay lands—from 48 to 54 bushels, 42 to 43 lbs. per bushel; an average crop of straw; 2 quarters more grain, but not as much straw as last year. Harvest 10 days before the usual time. Hay about 1 ton 15 cwt., very fine quality; clover very strong—second cutting exceptionally so; 1 ton less than last year; much better quality. Meadow hay more productive. Potato crop 7 to 8 tons this year; 4 to 5 tons last year; Regents one-third diseased; Champons hardly any; first noticed disease in the end of September. Turnip crop 15 to 20 tons; three times more than last year; first Swedes had to be re-sown owing to the continual drought; came away very fast, and grew rapidly after the rain came. Not much damage done by insects. No weeds, except some mustard (skelloch). Pastures very bare all season. Stock did uncommonly well considering the scarcity of grass, and were free from disease. Clip of wool about an average as to quantity and quality.

**PERTSHIRE (Highland District).**—Wheat—none grown. Barley—quality excellent; from 36 to 37 bushels; from 56 to 57 lbs. per bushel; 4 lbs. heavier than last year; average quantity sown, 4 bushels. Oats—quality excellent; average 41 bushels; from 43 to 44 lbs. per bushel; 3 lbs. heavier than last year; average quantity sown, 5 bushels. Harvest about a week earlier than usual, and three weeks earlier than last year. Hay—average quantity; about 13 cwt.; quality weak, but very well secured. Rye-grass chiefly defective; clover, average—about 7 cwt. less than last year. Meadow hay a splendid crop in the higher glens; throughout about 3 cwt. better than last year. Potato crop first class, quite  $4\frac{1}{2}$  tons; 1 ton more than last year; hardly any disease; several dilatory farmers lost more or less of their crop by the early frost. Turnip crop very good; average 20 tons; one or two cases of 30 tons; quality better, and about 4 tons more than last year; braird well; no second sowing required. Insects did no injury. Crops were not injured by weeds. Pasture was not rank but nutritive, comparing well with last year. Stock thrived well, and were free from disease. Clip of wool—quality very good; about 25 per cent. above average.

**PERTSHIRE (Dunkeld and Stormont District).**—Wheat excellent quality and weight; 36 bushels; seed sown, 4 bushels. Barley wants colour; heavy weight—30 bushels; seed sown, 5 bushels. Oats very good; 32 bushels; seed sown, 6 bushels. The quantity of straw both of barley and oats was much under last year. Harvest about the usual time in Lower Stormont, but ten days earlier in late districts. Generally the hay crop was short; on good land it may have touched 2 tons; much under an average crop. Meadow hay not much grown, but generally less productive. Potato crop about as good as last year—6 to 7 tons; not much disease on red lands, but more on light lands. Turnips—extra crop, from 26 to 30 tons; crop brairded well; not more than one sowing in general. Stormont Union Competition—1st prize, 23 tons 15 cwt.; 2d prize, 23 tons 6 cwt.; 3d prize, 23 tons 3 cwt. Not much injury by insects, grub, or turnip-fly. Not much weeds in general except on low-lying fields. Pastures an average crop, but first half of grass season was deficient. Stock thrived well, and were free from disease. Clip of wool an average, and good quality.

**FORFARSHIRE.**—Wheat about 36 bushels; straw and grain better than last year; about 3 bushels of seed sown. Barley—40 bushels; grain better than last year; straw short, but quantity good; about 4 bushels of seed. Oats—48 bushels; grain very much better than last year; straw short, but good; seed sown, about  $4\frac{1}{2}$  bushels. Harvest was early—about four weeks earlier than last year. Hay a very small crop; quality fair; weight about  $1\frac{1}{2}$  tons. No meadow hay. Potato crop about 8 tons—about 3 tons more than last year, and about 20 per cent. diseased. Disease commenced about the beginning of August. Turnip crop about 25 tons—good, much better than last year; crop brairded very irregularly, and in many cases sowing was necessary more than once, owing to the dry season. No injury from insects or weeds. Pasture very poor in the early part of the season, but improved after the July rains. Stock thrived fairly well, and were free from disease. About an average clip of wool.

**KINCARDINESHIRE.**—Barley—crop 1880, from 4 to 6 quarters; average, 5 quarters; average weight, above standard; straw—fair allowance, and quality good. Grain double in quantity to crop 1879, but straw in 1879 much more than 1880; seed sown, about 4 bushels, occasionally a trifle less. Oat crop 1880—lea oats would average from 5 to  $6\frac{1}{2}$  quarters; oats, after turnips and potatoes, from 3 to 5 quarters; good quality; straw—fair allowance, and good quality; grain almost double of crop 1879; straw not so bulky as 1879; seed sown—generally from 4 to 6 bushels. Harvest 1880 began about two weeks before usual time, and five or six weeks before that of 1879. Hay crop 1880—quantity 1 to  $1\frac{1}{2}$  ton; good quality; did not bulk largely; little clover, but weighed well; 1879—quantity 1 to  $1\frac{1}{2}$  ton; quality inferior; bulk greater than 1880, but did not look so well; appearance; more clover. Potatoes 1880—yield fully double of 1879, say 5 to 6 tons, and in 1879 2 tons, unless Champions, which were double crop to all others; disease very bad in 1879, unless in Champions; slight in 1880, but in 1880 have suffered severely from frost in pits. Disease began in August, and in many cases later, and in pits. Turnip crop 1880 more than double weight of crop 1879, and better quality; 1879—average weight say 6 to 10 tons; 1880—16 to 24 tons, but since January began crop 1880 has rotted to the extent of three-fourths of crop then in the ground. Crop 1880 brairded well in soft land, but unequally and late in hard or clay land, and in some cases two or more sowings were partially required. Lea oats in damp spots, or cold or partially stiff land, suffered from grub, but not to a large or unusual extent. On thin damp land sown with grain after green crop, crop was in some cases choked with weeds, or partially so. Pastures—fair growth and fair quality; not so great growth as in 1879, but quality much better. Stock thrived fair in 1880, but nothing more; badly in 1879; season too wet; cattle and sheep generally free from disease during past season. Clip of wool good quality, and over average generally.

**ABERDEENSHIRE (Buchan District).**—Scarcely any wheat grown. The quantity of barley this year would be about 14 bushels in excess of last year, and the quality is much superior both as regards grain and straw; the grain would be on an average from 7 to 8 lbs. per bushel heavier. The yield of oats this year will be about 14 bushels over that of last year, and the weight from 3 to 4 lbs. heavier than last year, in which, except along the sea-coast, the yield and weight of all kinds of grain was very poor. Harvest began some fifteen days sooner than usual. Hay about the same quantity, but of much better quality; last year, though there was a full bulk, the quality was very inferior. Meadow hay very little grown. The yield of the potato crop would exceed that of last year by 2 to 3 tons; the older kinds were very much diseased, to the extent of 30 per cent., whereas the newer and apparently hardier varieties (the Magnum Bonum, &c.) were very little; the disease showed itself evidently about the middle of Sep-

tember. The weight of the turnip crop this year may be put at from 17 to 20 tons, and in excess of last year of about 10 tons. On some parts of stiff and mossy land braird was hard to come; re-sowing had not generally to be resorted to. No injury by insects. Owing to the favourable season during hoeing for cleaning the land, weeds did not obtain the same hold as in a wet season. Although the average growth of the pastures was not in excess of last year, it was of much superior quality. Stock made much better progress this year than last year, and were entirely free from disease. Clip of wool about an average.

ABERDEENSHIRE (Formartine).—Wheat is not grown to any extent, only in some of the heavy soils; last year the quantity on an average 32 bushels, grain weighing 56 lbs. per bushel, with an abundance of straw; this year about 48 bushels, grain weighing 66 lbs. per bushel and not nearly so much straw. Barley and bere or bigg are much cultivated—last year about 28 bushels, grain weighing 49 to 51 lbs. per bushel, straw abundant; this year 36 bushels, grain weighing 54 to 56 lbs. per bushel, straw not so abundant as last year; grain was much discoloured before reaping by misty or foggy weather; on some early farms the return was not so good as expected, as the bright sunshine hastened the crop too fast to maturity; quantity sown, 4 bushels barley and 3 bushels bere or bigg. Oats is the staple crop; on early and open bottomed soils there is not more than 4 to 6 bushels over last year, but last year's crop would be 28 bushels with a very large proportion of straw, grain weighing 38 to 41 lbs. per bushel; this year 38 to 40 bushels, grain weighing 42 to 45 lbs. per bushel, the straw not nearly so abundant as last year, but where harvested before the rains is of excellent quality. There seems, however, to be some doubt whether the straw of this year's crop possesses more nutriment or feeding qualities than last year's crop; quantity sown, 6 bushels. Harvest commenced last year about 28th September and this year about 20th August. The hay crop not so heavy as last year but the quality superior—last year about 2 tons this year 1½ tons. No meadow hay. This year's potato crop is the best and most abundant since 1846; last year the average would be about 6 or 8 tons, this year about 9 to 12 tons—gross big and little. The older sorts, such as the Regents, Victorias, and Glenbarries, were about one-third diseased when lifted, and are still going wrong in the pits; while the Champions and Magnum Bonums were free from disease when lifted, and are still keeping well in the pits. The disease made its appearance among the older sorts about a month before lifting time. From the intense frost that has prevailed this year a good many are frosted in the pits and reduced to a pulp. Turnip crop was the best and most abundant that has been for many years; but from the severe and long-continued intense frost quality has been much deteriorated. The yellow (fleshed) turnips on some farms are reduced to a pulp; this crop brairded well and came away very fast to the hoe; in fact it was with great difficulty that hoers could be got to single the turnip plants in time; no second sowing was required. Last year this crop was very deficient, and would not average more than 12 tons; this year the average would be from 16 to 20 tons, and on some farms as high as 25 tons. No damage done by insects. This was a splendid season for cleaning the land, and therefore there was no weeds. Owing to the great scarcity of turnips last year, cattle and sheep were turned upon the pastures much earlier than usual, hence the fields were eaten down and kept short during the whole season; when relieved of stock for a time the growth and quality good. As a number of the cattle and sheep were in rather lean condition from the want of a full supply of turnips during winter and spring, they were six weeks upon the grass before any perceptible difference could be observed, but after that time they throve well.

There has been no contagious or infectious disease for some considerable time, and the stock generally have been very healthy. The clip of wool was over last year by nearly 1 lb. per sheep.

**ABERDEEN** (Garioch District).—Scarcely any wheat grown. Barley—38 bushels as against 20 bushels last year; grain much superior to last year; straw same as last year; quantity sown,  $4\frac{1}{2}$  bushels. Oats—36 bushels, last year 24 bushels; grain superior, but straw scarcely so nutritious as last year; quantity sown 6 bushels. Harvest was commenced about the usual time, from 22d to 26th August. Hay crop not so heavy as last year, but quality good and well mixed with rye-grass and clover; quantity about 1 ton 8 cwt. No meadow hay. The yield of potatoes much greater than last year; very little disease, but it is to be feared that they have been much injured by the severe frost in January; weight 5 tons. The weight of turnips was 7 tons above that of last year, and quality similar; crop braided well, and only one sowing required; weight  $22\frac{1}{2}$  tons. The damage done to the remaining part of the crop by the frosts in January is beyond calculation. No damage done by insects. The land is generally well cleaned, and no injury from weeds. The pasture grass was not equal to the previous year in quantity, but the quality appeared good; stock rested and thrived well, and were generally free from disease. The quality of the wool clip was good, but weight under the average.

**ABERDEENSHIRE** (Strathbogie District).—Little or no wheat grown, the principal grain crops being barley, bere, and oats, three-fourths of the breadth sown being the last mentioned cereal. With respect to the barley crop, the bulk of straw was fully equal to last year, and the quality very good; the yield of grain, although good, did not come up to the expectation which the bulk of the straw warranted. On the finer soils as much as 48 bushels has been threshed, but the general average would be from 36 to 38 bushels, and the weight from 53 to 58 lbs. Notwithstanding the fine dry summer samples are very dark in colour. The oat crop as a rule was the best that has been harvested for many years as regards quality and quantity of both grain and straw, the greater part of the crop being secured in excellent condition; the yield on fine deep land being as high as 64 bushels, but the general average would be about 46 bushels; the weight varies from 40 to 46 lbs., the average weight being about 42 lbs.; the quantity of seed generally sown is from 4 to 6 bushels, but as doubts existed last spring as to the vitality of some of the seed which was exposed to the frost the previous harvest, as much as 8 bushels was in some instances sown, and after all the crop was not too thick. Harvest was general on the 1st of September, fully five weeks earlier than in 1879, and about ten days earlier than in average years. The hay crop was, generally speaking, lighter than last year, but of far better quality. Clover as a rule was deficient when the crop was cut, but came up pretty thick in the aftermath; the average yield would be from 24 to 27 cwt. No meadow hay grown. The potato crop was the best, with respect to both quantity and quality, that has been for many years. Disease appeared among the earlier varieties about the middle of September, but did not much affect the general crop. Champions were altogether free from disease; the weight of this crop would be from 6 to 7 tons; this crop is not much cultivated. The turnip crop braided well, and very little second sowing was required; up to the time of second hoeing the plants looked healthy, but after some heavy falls of rain finger and toe made its appearance, chiefly on many farms wrought on the five-course rotation; Swedes were more generally affected than Yellows, and in many cases fully a fourth of the crop was destroyed. Where there was no disease the crop was generally very good, and the weight would be from 20 to 30 tons; the severe frost experienced in December and January has made great havoc in

this crop where not stored, and in many cases two-thirds the Yellows have completely rotted; Swedes have stood out better, but are very much deteriorated in quality. There was no unusual destruction of crops by either insects or weeds, the latter having been less abundant than in average years. The pastures were generally good, and much more abundant than last year. Stock made more progress during the grass season than they have done for several years. This may be accounted for partly from having been upon short allowance during the winter owing to the failure of the turnip crop, and partly on account of the fine dry summer. There was no disease either among cattle or sheep. The quality of the wool was fully up to the average, and the quantity about the average.

**BANFFSHIRE (Lower District).—**No wheat grown. Barley, 35 bushels in 1880, as against 24 bushels in 1879. Quality very inferior in 1879, but excellent, both grain and straw, in 1880. Oats, 36 bushels in 1880, and quality of grain and straw excellent, against 26 bushels in 1879. Harvest three weeks earlier in 1880 than usual, and considerably shorter. Hay crop, 1 ton 15½ cwt. in 1880, and of excellent quality, against 1 ton 4 cwt. of very inferior quality of hay in 1879. No meadow hay. Potatoes not much grown, but in 1880 the yield might be 8 tons as against 5 tons in 1879. Turnip crop—20 tons in 1880, against 10 tons in 1879. Quality, where stored, very greatly better in 1880 than in 1879. Came well in 1880, and few were re-sown. No insects. No injury by weeds in 1880, but great injury by wild mustard in 1879. Pastures of average growth and quality, and feeding power much greater than in 1879. Cattle thrive well and were free from disease. Few sheep, but clip of 1880 would be about average.

**BANFFSHIRE (Upper District).—**No wheat grown. Barley was a full crop of extra quality in 1880, at least double the quantity of crop 1879, and the weight per bushel in 1880 was from 6 to 8 lbs. more than the previous year. The straw was fair quality both seasons, and not so deficient as the grain in 1879; the usual quantity of seed sown is 4 bushels. Oats were a full crop in 1880 both as regards grain and straw; sample particularly clear, and weight from 42 to 43 lbs. per bushel, or 3 lbs. over an average, in 1879. Oats were deficient both in quantity and quality, but the straw, owing to being green cut and well harvested, was superior quality for fodder; an average of 6 bushels is usually sown. The early summer being dry, with a high temperature, all crops made great progress, which was continued by the genial showers in the end of June. The crops never lost the early start, and came to maturity at least fourteen days earlier than an average season, and from four to five weeks before 1879. Owing to the dry weather in May, and through the greater part of June, the hay crop was under an average bulk, but fine quality, with a full proportion of clover. The fine dry season enabled the crop to be secured in excellent condition; the average weight would not exceed 1 ton. Meadow hay is not grown. Potatoes, where properly laid down with a full quantity of manure, were nearly double an ordinary crop, or about 7 tons; quality very fine, partly diseased; disease appeared early in October. Potatoes are not usually grown as a marketable commodity, and do not receive the same careful treatment as where this is so. Turnips were considerably over an average crop, particularly Yellows; Swedes do not grow to the size usually met with on the finer soils of either Aberdeen or Moray shires; the average weight would be about 20 tons; quality originally good, but those in the ground are all destroyed by the long frost; braird regular; no case of second sowing. No injury by insects. The dry warm season prevented the growth of the most noxious of all weeds, *Yarr*, now very common in wet cold seasons; it is caused from weakness in the soil, induced by the too frequent application of stimulants in the form of ammonia, nitrate, and

sulphuric acid, which is ruining both the land and the farmers. The pastures, after the middle of May, were generally abundant and fine quality, and, owing to the warm and moderately dry summer, stock of all kinds made good progress, a great contrast to the season of 1879 when the cattle made no flesh, although in full pastures. Cattle and sheep both thrive well, and were quite free from disease. The sheep kept are mostly black-faced, the clip from which was a full average weight and quality.

**MORAYSHIRE.**—Wheat—the grain would be one-half more than last year in quantity. 1879 was a bad year for out-turn of grain owing to its extreme wetness. 1880, on account of its dryness, was a good wheat year, the straw rather under quantity of 1879, but the quality of both grain and straw very good, being well harvested; the quantity of grain would be about 34 bushels. When sown by the drill, from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  bushels; and when sown broadcast, about  $3\frac{1}{2}$  to  $4\frac{1}{2}$  bushels. Barley would be rather under an average as to quantity of grain and straw, but the quality of both very good, some samples of barley being 60 lbs. per bushel. The weather was extremely dry during the months of May and June, which prevented the crop from making a good start to ensure bulk of straw and quantity of grain. Compared with 1879 the quantity of grain would be fully one-third more, but the bulk of straw one-third less; average, 32 bushels. Oats are not largely sown, the soil being too dry for them. Compared with 1879 the bulk of straw would only be about one-half, but the quantity of grain one-fourth more than in 1879. This applies to the earlier district. In the later and damp soils the quantity of straw would be only one-fourth less, while the quantity of grain would be one-half more; the average of grain would be about 32 bushels. Harvest began about one month earlier than in 1879, and from two to three weeks earlier than the average. The summer being extremely hot and dry, in the lighter and sandy soils forced the crops to early maturity. Less rain perhaps fell in the lower districts of the county than in any other district in Scotland. Except on some low-lying damp soils the hay crop was extremely light, in most cases not over one-half of the weight of 1879, and the quality rather inferior from a deficiency of clover. On light soils the quantity would not be more than 10 cwt; on heavier soils, 30 cwt. No meadow hay. The potato crop would perhaps be nearly double that of last year, and scarcely any disease; the quantity would vary from 3 to 6 tons. The weight of the turnip crop would be one-third heavier than last year, and quality superior. A fearful gale of wind on the 26th May levelled down the drills on a large portion of the light soils which required to be re-sown, and the extreme drought prevented braiding on the heavy soils in many cases till far on in the season, still they turned out well; the crop in whole above the average; the weight would be from 10 to 23 tons. Great damage has been done to the turnip crop by the very severe and protracted frost of the past two months. A large portion of the bulbs, where not furrowed up, are fast decaying, more especially the Yellows, which are almost useless. Little or no damage by insects, and not more than ordinary by weeds, but a very considerable portion of the land is not nearly in that state of cleanliness from weeds which it ought to be, and might be. The pastures in general did not produce more than about one-half of the grass of last year. On the higher lands in the month of June, they were burned quite brown, affording very little food for stock, but the extreme heat seemed to make up for the deficiency to a considerable extent. As a rule stock did not make much progress on the pastures, but were free from disease. The previous winter being mild and favourable for the growth of wool, the clip was fully an average.

**NAIRNSHIRE.**—No wheat grown. Barley and straw an average crop, of good quality, but not so abundant as last year. Grain over an average, say 28

bushels; weight, 58 and 59 lbs. per bushel not uncommon;  $3\frac{1}{2}$  bushels seed in low and well-cultivated lands, and 4 in high and poorer soils. The remarks on barley apply to the oats; average yield say 32 bushels; weight a good average, but does not exceed the average so much as barley. Harvest began at the usual time, but finished three weeks earlier than last year. Hay a light crop, under the average; the drought and scorching heat in June causing the thinning and stinting of both clover and ryegrass, each of which looked most promising in the early part of the season. No meadow hay. Potatoes double the crop of last year, and of excellent quality, almost free of disease; average, 5 tons. Turnips a very large crop, much above an average, of fine quality, but latterly very much injured by the severe frosts; braided well, but a good deal of second sowing in consequence of wind, and, in some places, want of moisture; Yellows, 20 tons—Swedes, 25 tons. A large extent of the turnip crop, especially the Swedes, are let to be consumed on the ground by sheep; the continuance of frost, with slight thaws now and then, has destroyed a large proportion of this crop. The pastures during the months of June, July, and August were very bare on account of the drought and heat; more abundant during the earlier and later part of the season, and of good quality throughout. Stock thrived well, much better than in the wet season of 1879, and were free from disease. Clip of wool good and over an average.

INVERNESS-SHIRE (Inverness District).—Wheat—quality of grain and straw excellent; average yield about 28 bushels, being about a third more than in 1879; bulk of straw less, but quality much superior; from 3 to 4 bushels of seed usually sown. Barley—quantity about 40 bushels on best soils, and about 28 bushels on lighter soils; quality very superior, the weights being unusually high; average about 57 lbs. per bushel. Straw fine quality, but much less in quantity than 1879; average quantity of seed,  $3\frac{1}{2}$  bushels. The yield of oats above an average, while quality is very superior compared with former years. Straw also excellent, but less in bulk than in 1879; quantity of oats about 40 bushels an average on good soils, and about 26 bushels on lighter soils; about 4 bushels sown. Harvest began earlier than usual by about a fortnight. It was some five weeks earlier than in 1879. Average quantity of hay on good land about 2 tons; quality very superior to crop 1879. The crop was well mixed with clover and ryegrass. The seed, where saved, is excellent, though less in quantity than in some former years. Very little meadow hay grown. The yield of potatoes in many cases was double that of 1879; average not less than one-third more. Very little disease affected the tubers. On land adapted for potatoes the average return would be about 7 tons, while poor land would average about 4 tons; exceptional crops some 10 tons. The turnip crop was much superior to crop 1879, both as regards quantity and quality; the average yield on good land would be about 25 tons, while on light land about 17 tons would be an average. On clayey and gravelly soils re-sowing was to a small extent resorted to owing to dry weather. Frost has damaged the crop almost entirely where unsecured. On some light soils insects affected the plants to a small extent, but not so seriously as to injure them; small, long wire-looking worms. No injury by weeds. The weather favoured cleaning till towards the end, when soft growing weather promoted usual growth. Rag weed, wild mustard, chief weeds. Pastures superior in quality. Stock thrived excellently and were free from disease. The winter of 1879–80 being fine, the clip of wool was a full average.

INVERNESS-SHIRE (Beauly District).—Wheat—40 bushels, fine quality, 63 lbs. per bushel; 20 bushels over last year; 3 to 4 bushels sown. Barley—36 bushels, fine quality, 57 to 59 lbs. per bushel; on clay and wet lands only 20 bushels; average, 36 bushels; 6 bushels over last year; 4 to  $4\frac{1}{2}$  bushels sown. Oats—average 41 bushels, on fine land 52



bushels, on clay land a very light crop, not over half above; weight, 43 to 44 lbs.; 10 bushels over last year; very fine straw; 5 to 6 bushels sown. Harvest two weeks earlier. Hay a short crop, poor quality,  $1\frac{1}{2}$  tons; on cold clay lands half a crop; one-half under last year. No meadow hay grown. Potato crop— $6\frac{1}{2}$  tons; Champions and Red Rocks, a large crop; Victorias and Regents, average; White Rocks and Blues, very deficient; not half a crop on poor light land; almost no disease; no injury either by insects or weeds. Pastures an average growth after the rains set in. Stock thrived well, and were free from disease. Clip of wool good, a full average.

INVERNESS-SHIRE (Skye District).—No wheat or barley grown. Oats—36 bushels, a third better than last year; the usual quantity sown is about 6 bushels; the quality of the grain and straw was good. The harvest began rather earlier than usual. The hay crop was average as to quantity; quality very good. Meadow hay less productive than last year owing to the drought. The potato crop was one-fourth less than last year, disease appeared slightly in August, but did not become serious. The turnip crop was about 4 tons an acre under the average; quality ordinary; braided very well but finger-and-toe prevalent; no injury by insects or weeds. Pastures, owing to drought, much below the average. Stock thrived well considering the scarcity of grass, and were free from disease. The quality of the wool-clip was good, fully an average.

INVERNESS-SHIRE (Fort-William District).—No wheat or barley grown. Oats—25 to 27 bushels; both straw and grain much superior to last year's crop; seed, 5 to 6 bushels. Harvest a good deal earlier than usual, two weeks fully earlier. Hay crop about 1 ton 4 cwt., quality better, and much better saved than last year. Meadow hay above average productiveness, and very good in quality. Potato crop about 5 tons; disease light, and in some cases absent altogether. Turnip crop—18 to 24 tons; crops generally braided well, and almost no second sowing necessary. Some grub affecting tubers of potatoes; damage by weeds less than usual, chickweed the most troublesome. Pastures on good heavy land equally good with last year; thin and mossy land not up to an average. Stock, on the whole, not up to an average of years; were free from infectious diseases; pining and trembling or louping ill have prevailed above average of years. Clip of wool good both as to quality and quantity—rather above average.

S-SHIRE.—Wheat—32 bushels, being about one-third more; small breadth sown; seed sown,  $2\frac{1}{2}$  to 3 bushels; summer fine and hot, and quality much superior. Barley—40 to 42 bushels, being about one-third more; seed sown,  $3\frac{1}{2}$  to 4 bushels; weather suitable; quality superior. Oats—38 bushels; straw, 10 per cent. less, quality slightly better; weather rather dry for oats. Harvest, average time of beginning. Hay—24 cwt., being lighter yield by 20 per cent. No meadow hay. Potato crop—5 tons 5 cwt., being about one-third more; some disease, say under 5 per cent., which commenced about 10th August. Turnip crop (Swedes)—return in 1879, 12 tons; in 1880, one-third less; (Yellows)—1879, 15 tons; 1880, one-third less; quality much spoilt by finger and toe; braided slowly on account of dry weather, and little second sowing on that account. No injury from either insects or weeds. Pastures of average growth and quality on the whole and dry. May was very cold; weather affected them in July, but grew well and fast in August and September. Stock thrived extra well, and were free from disease. Clip of wool good and average.

SUTHERLANDSHIRE.—Wheat—40 bushels; grain and straw good; only grown on one farm; 4 bushels seed. Barley—32 bushels; grain and straw good; 4 bushels seed. Oats—36 bushels; grain and straw good; 5 bushels

seed. Harvest fourteen days before usual time. Hay crop—1 ton; better quality than last year and less quantity. Meadow hay much more productive. Potatoes—a big crop; average about 6 tons; almost free of disease. Turnip crop more weight and good quality; average may be 18 tons of Swedes and 14 tons of Yellow; on some farms partially destroyed by finger and toe. No insects. Good deal of runches owing to wet season. Good grass season; but from the wet season and cold nights stock did not feed well. Cattle and sheep were free from disease. Clip of wool—quality good, and full average.

**CAITHNESS.**—No wheat grown. Bere mostly grown; quantity and quality much above last year; weight heavier by from 4 to 5 lbs. per bushel; average quantity, 36 to 38 bushels; seed sown, 4 bushels. Oats—a fine crop, and good quality of grain; produce, 38 bushels; seed sown, 5 to 6 bushels. Harvest about ten days earlier than usual. Hay crop secured in fine condition, about an average. Clover deficient. Meadow hay—crop better than last year. Potatoes only grown for home consumption; better crop than last year; disease less. Turnips—a good crop, fully one-third better than last year, but considerable loss from finger and toe in many cases—hence weight variable from 12 to 25 tons; only one sowing required. Damage over average from grub in oats from lea; injury from weeds small. Pastures in many cases thin at root; growth and quality otherwise fair. Stock did well, and were free from disease. Quality of wool-clip fair; quantity rather under average.

**ORKNEY.**—No wheat and very little barley grown. Oats—34 bushels; weight upwards of 42 lbs.; quality of grain and straw much better than last year, generally 5 bushels sown. Harvest about a fortnight or three weeks earlier than usual; quantity of hay crop an average, about 200 stones; quality good, better than last year. Clover was a good crop. Meadow hay crop much the same, if anything less. Yield of potatoes exceedingly large, about 6 tons and of excellent quality; disease very slight, appeared in August. Turnip crop good, about 15 tons; braided well, and with a few exceptions did not require to be sown a second time. No damage by insects. Weeds less than usual, principally runches and wild mustard. Pastures fully an average, stock thrived well, and were free from disease. Quality of clip of wool good and rather over average.

**SHEPHERD (Unst).**—No wheat or barley grown. Bere—straw light, not more than last year; grain light, but thrashed well out, and bulks an average. Oats quite an average crop of about 36 bushels; quality good, and weight 40 to 43 lbs. per bushel. Straw short after turnips, and quite a fourth under average crop; braided beautifully, and made good progress until June, when the dry weather told upon it; from 5 to 6 bushels sown. Harvest began 31st August, three weeks earlier than in 1879, and a few days earlier than an average of the last ten years. Rye-grass hay crop generally short, and rather under an average; clover conspicuous by its absence, so that the weight as taken into the stackyard may be stated at quite a fourth under an average, it was, however, cured without a shower, and therefore excellent in quality. Meadow hay crop under an average in weight owing to the dry character of the summer, but being easily cured is excellent in quality. Potatoes quite an average, and one-fourth more than last season; quality very fine; some places disease rather severe, made its appearance about the middle of July, but did not make much progress after lifting. Turnips about 20 tons, or double 1879; quality excellent; braided beautifully; no second sowing required; weeds easily kept down. This crop received no check and quite an average crop. Insects much less than usual; not troubled much with insects of any kind. Exceptionally little weeds. The winter of 1879–80 was a very fine and open one. Spring was early, and

pastures grew steadily from February. The season was rather dry, but unless on thin land, the pastures were good and kept plentiful. Stock thrived very well, and quite free from disease. Clip of wool about a stone per 100 sheep over last year, and much better in quality; about an average clip.

**SHETLAND (Fetlar).**—No wheat or barley grown. Chester or bere is used instead of barley. From the very dry season the crop was inferior in quality and quantity, both as regards corn and straw. Oats—from the same cause, the dry season and sandy soil, this crop was very inferior; indeed, the greater part of it being in a very sandy soil was little more than grass and weeds, and the greater part has been given to the cattle as it grew without being threshed. Harvest about a fortnight or three weeks earlier than usual. Hay crop rather less in quantity, but excellent in quality. Both clover and rye-grass was good in quality; and the second growth of clover was excellent. Meadow hay crop less productive than last year, but good in quality. The potato crop was rather above an average; there was a little disease, but not much. It did not begin till late in the season, not earlier than the end of September. The turnip crop was quite equal to last year both in quantity and quality. The early sown and Swedes braided well; the last sowing was long in braiding, but turned out to be an average crop notwithstanding. No injury by insects. Weeds injured crops, chiefly wild mustard. Pastures were inferior where ground was dry, but on wet ground, of which there is a good deal, they were very fair; stock thrived on the whole pretty well, and were free from disease. Clip of wool about an average.

#### METEOROLOGY OF 1880.

THE fine summer of 1880 stands out in marked contrast to the disastrous summer of 1879, its comparative dryness over the whole of Scotland, and the unusually high temperature which characterised the weather of August and September, being peculiarly favourable for the proper ripening and ingathering of the grain crops.

In order to show the chief features of the weather of 1880 in its relations to the crops, seven maps have been constructed, as in the previous year, showing the degree to which the temperature rose above the average of each month from April to October, or fell below it, over all parts of Scotland; and also other seven maps, showing the percentage of the rainfall above or below the average of each of these months. A set of tables has also been prepared, giving the daily rainfall for the same months from many places representing the different districts. From these maps and tables the following account of the weather of Scotland during the growing months of 1880 has been prepared,—the maps and tables being lodged with Mr Menzies, Secretary of the Society:—

**APRIL.**—In this month the temperature was above the average in Shetland, Orkney, and in the north and west as far to southward as Islay. The excess was about 3° in Shetland, 2° in Orkney, and 1°·5 in the Outer Hebrides. It was also above the average along the shores of the Solway, and in eastern districts from

Gordon Castle to Berwick: but in these cases the excess nowhere amounted to a degree. On the other hand, temperature was from  $0^{\circ}5$  to  $1^{\circ}$  below the average at all inland situations from Loch Ness to the Cheviots. The distribution of the rainfall was very unequal, being about a third under the average over a small district near the mouth of the Tweed, and in all northern districts to the north and north-west of Strathspey. In all other parts of the country more than the average rain fell, particularly over the district marked off by a line drawn from the mouth of the Tay to Ayr, and thence round by Carsphairn and Bowhill to Yester, the excess at Wanlockhead being 176, and at Lanark and Edinburgh 150 per cent. above the average of April. Thus in the extreme north the weather was unusually warm and dry, but in the inland districts of the south very wet and somewhat colder than usual.

MAY.—Temperature was slightly above the average from Culloden northward, over Orkney and Shetland, and along the west coast as far south as Mull. It was also above the average over eastern districts lying between the Grampians and the Firth of Forth, the excess being from  $1^{\circ}$  to  $1^{\circ}5$ . In other parts of the country it was colder than the average, the lowest temperature being experienced south of the Forth; Edinburgh, for example, being  $2^{\circ}$ , and Lanark and Stobo  $1^{\circ}6$  colder than the average. The rainfall, except in a few spots in the west, was everywhere under the mean; the amounts varying from a fourth to two-thirds short of the average of May. Hence in Strathmore the weather of May may be described as having been drier and warmer than usual, and from Mid-Lothian to Upper Nithsdale and Annandale drier and colder.

JUNE.—Temperature still continued above the average from the Firth of Forth to the Grampians, and the area of high temperature extended west through Perthshire, south to Rothesay, then west to Barrahead, and north to Shetland, the greatest excess being  $1^{\circ}6$  at Pitlochrie, and  $2^{\circ}$  in Skye and the Uists. The weather was from  $0^{\circ}5$  to  $1^{\circ}3$  colder than the average over all districts draining into the Moray Firth, and in the valleys of the Dee and Don, and also over the whole of the south of Scotland. The rainfall was above the average in two districts, the one including Sutherland and Ross-shire, the excess at Lochbroom being 54 per cent.; and the other Aberdeenshire and part of Strathspey, the rainfall at Cluny Castle being fully double the usual fall of June. Elsewhere it was below the average, the greatest (a half to three-fourths short of the average) being in inland situations from Aberfeldy to Drumlanrig and Bowhill. Thus over the whole of the west the weather of June was warmer than usual, with a rainfall only slightly in excess of the mean; from Gordon Castle to Inverness colder and drier; over

the rest of the Moray Firth and in Aberdeenshire colder and wetter; in Strathmore warmer and drier; and over the whole of the south of the country drier and colder than usual.

**JULY.**—In this month the area of higher temperature is seen to have contracted into much smaller dimensions, including now only Strathmore, the north-east of Fife, and western districts from Rothesay north to North Uist and Skye. In the north of Orkney and the south of Shetland temperature was also above the average. Nowhere, however, except at Monach, west of the Hebrides, did the excess exceed  $1^{\circ}$ . In all other parts of Scotland temperature was below the average, the greatest deficiency, about  $2^{\circ}$ , occurring in the districts indicated by the following stations, viz., Lairg, Nairn, Gordon Castle, New Pitsligo, Braemar, Aberdeen, Stronvar, Pentland Hills, Milne-Graden, and Wolfelee. This is now the fourth month that the temperature in Strathmore has been above the average, and the temperature of Mid-Lothian and districts to southward under the average. If a line be drawn through the east side of the Minch to Mull, thence east to Balloch Castle, south to Loch Ryan, and thence curving round by Drumlanrig, Wanlockhead, and Milne-Graden, it will divide Scotland into two parts, the division to the west and south having a rainfall under the average, and that to the east and north above it. Another peculiarity of the rainfall of July was the strongly-pronounced local character of its distribution. Thus while it was 124 per cent. at Culloden, and 112 at Grantown above the average, it was only 20 at Nairn; while it was 133 per cent. at Thirlestane Castle, and 111 at Galashiels above the average, it was 14 below it at Milne-Graden; and while at Stornoway it was 41 per cent. under the average, at Scourie on the opposite side of the Minch it was 91 per cent. above it.

**AUGUST.**—This was one of the finest Augusts of recent years. The temperature over the whole country was above the average, and very considerably so. The excess rose near to, or slightly exceeded  $4^{\circ}$  in three different parts of the country, viz., Strathmore, Argyllshire, and the extreme north-west of Scotland, including the Outer Hebrides. On the other hand, in Berwickshire, the Cheviots, and across into Cumberland, the excess above the average scarcely amounted to  $2^{\circ}$ . In other districts the excess was generally about  $3^{\circ}$ . This high temperature was accompanied with a singularly small rainfall, the deficiency in many places coming close up to or exceeding 90 per cent. of the usual August rainfall. At none of the stations was the deficiency less than 50 per cent.

**SEPTEMBER.**—The mean temperature for September was everywhere above the mean, the excess being from  $3^{\circ}$  to  $4^{\circ}$  from Barra-head to North Uist, and on the eastern seaboard from Gordon

Castle to the mouth of the Tay; from  $2^{\circ}$  to  $3^{\circ}$  from Fifeshire southward to Bute, in Berwick and Roxburghshires, and along the Solway; and in other parts of Scotland from  $1^{\circ}$  to  $2^{\circ}$ . The rainfall was above the average, from 10 to 33 per cent. to the north of a line passing through the Minch and the north of Sutherland and Caithness to Wick; and from 10 to 50 per cent. to the east of a line passing through Aberdeen, Arbroath, Dundee, Stirling, Lanark, Wanlockhead, and Silloth, the greatest excess being on the Lammermoors, Pentland, and Upper Tweeddale. Everywhere else the rainfall was under the average, particularly in Skye, Lochbroom, Strathspey, and the mouth of the Clyde, in all which districts the deficiency fell to, or even under, 50 per cent.

OCTOBER.—Everywhere the mean temperature of October was from  $2^{\circ}$  to  $6^{\circ}$  below the average of the month, the greatest deficiency of temperature occurring at Lairg, Roy Bridge, Dalnaspical, Pitlochrie, Ayrshire, Upper Clyde, and Tweeddale. In not a few places, particularly in inland situations, the sharp frosts which accompanied these exceedingly low mean temperatures did no little damage to the potato and turnip crops. The rainfall exceeded the average in Mid and East Lothian and east of Berwickshire, the excess at Edinburgh being 66 per cent.; and also to the north of a line passing from Aberdeen through Grantown, Inverness, Dunrobin, Scourie, and Stornoway. Everywhere else the rainfall was very greatly under the average, only a fourth part of the usual October rainfall having been noted over three-fourths of the whole surface of Scotland; and over a broad patch stretching from the Firth of Clyde to the Tay, the rainfall was about 90 per cent. below the average. It will be noted that the foreshores, looking north, of the Firth of Forth, the Moray Firth, and the Pentland Firth, had a more than usually heavy rainfall, while the weather in other parts of the country was singularly dry,—a marked contrast of not unfrequent occurrence, with heavy north-east gales.

Generally over the country, the harvest commenced about a fortnight earlier than usual; in some districts such as Moray, Banff, and Lower Clydesdale about three weeks earlier; whilst on the other hand, it began only about the average time in Mid and East Lothian, Selkirk, and Roxburghshires, and in Berwickshire it was even four days later than the usual time. These later districts, it will be noted, mark off the region where temperatures under the average ruled in May, June, and July.

Wheat and barley were everywhere above the average; but the rains which set in in Selkirkshire in harvest darkened the colour of the barley; and that colour was also damaged in Upper Banffshire and in the Dunkeld and Highland districts of

Perthshire. Over large breadths of Scotland, however, the fine warm season resulted in a yield and quality of grain singularly fine, particularly where the autumnal rains did not occur.

Oats generally were above the average, exceptions occurring, however, in the counties of Dumbarton, Ross, and Shetland, where the season proved too dry for a satisfactory yield from this cereal. In Ayrshire and the lower parts of Banffshire the crop was an exceptionally good one.

Turnips were generally a very good crop, in some cases exceptionally so; but in some districts, such as Easter Ross, the drought resulted in a crop a third under the average, and in other districts the early frosts of the latter half of October seriously injured the crop.

Potatoes were above an average crop everywhere, except in Skye, where the crop was a fourth under the average. The severe frost about the 20th October did no little damage to the crop in the drills and in pits in the counties of Roxburgh, Ayr, Lanark, Perth, Kincardine, and Aberdeen, or in those districts where the frost was locally most severe. The returns regarding the appearance and prevalence of disease are of the greatest importance as marking the beginning of a practical inquiry into the spread of the potato disease. It is as yet premature to draw any conclusions from the data; but it is interesting to note that but little disease, and in many cases no disease at all, appeared on the lands sloping down to the Moray Firth, and along the Caledonian Canal; and that the disease was worst to the south of the Firth of Forth; in other words, precisely over that wide district where the skies had been less clear and the temperature less genial than elsewhere, and most particularly where the late autumnal rains set in with more than their usual amount and frequency. The returns referring to the different degrees in which the different varieties of the potato resist or succumb to the inroads of the disease is another branch of the inquiry which will, it may be safely predicted, lead, in a year or two, to results of the highest importance to the farmer.

AGRICULTURAL STATISTICS OF SCOTLAND.—RETURNED UPON 4TH JUNE 1880.—(Extracted from the *Government Returns*.)  
TABLE No. 1.—TOTAL ACREAGE UNDER EACH KIND OF CROP, BARE FALLOW, AND GRASS, IN EACH COUNTY OF SCOTLAND.

COUNTIES.	Total Acreage under Crops, Bare Fallow, and Grass.	CORN CROPS.						GREEN CROPS.						Clover, Sanfoin, and Grasses under Rotation.	Permanent Pasture or Grass not broken up in 10 years (exclusive of Heath or Mountain Land).	Flax.	Bare Fallow or Uncropped Arable Land.		
		Wheat.	Barley or Berv.	Oats.	Rye.	Beans.	Peas.	Total.	Potatoes.	Turnips.	Mangold.	Carrots.	Cabbage and Kale.					Vetches, &c.	Total.
1. Aberdeen . . .	603,226	114	16,264	193,316	412	154	227	212,767	3,226	92,972	14	95	81	2,815	104,203	259,645	26,881	2	748
2. Argyll . . .	119,219	7	2,558	20,202	498	315	4	23,584	7,252	5,203	64	38	164	35	12,781	30,180	61,087	—	1,597
3. Ayr . . .	317,387	3,305	3,638	60,385	824	1,201	8	53,061	10,012	7,455	734	431	176	241	19,048	99,055	138,510	—	1,712
4. Banff . . .	167,917	236	7,781	58,749	148	153	237	62,099	2,668	25,200	6	6	11	994	28,875	67,697	8,946	—	300
5. Berwick . . .	167,917	236	7,781	58,749	148	153	237	62,099	2,668	25,200	107	29	606	13	3,904	88,645	36,517	—	262
6. Bute . . .	25,214	89	22,196	35,628	121	1,990	237	64,044	3,417	20,000	19	3	9	13	2,904	26,888	10,206	—	26
7. Caithness . . .	105,551	10	1,406	34,351	145	2	39	5,794	1,331	1,595	13	3	9	13	2,904	26,888	10,206	—	26
8. Clackmannan . . .	15,691	687	1,035	3,206	—	844	—	5,772	402	964	21	2	17	73	16,967	3,171	4,926	—	554
9. Dumfriesshire . . .	46,432	1,331	1,035	3,206	—	844	—	5,772	402	964	21	2	17	73	16,967	3,171	4,926	—	554
10. Dumfries . . .	231,447	407	1,484	48,243	107	61	4	50,406	5,320	19,943	71	29	262	159	25,783	71,450	83,221	13	98
11. Edinburgh . . .	134,344	4,866	11,095	22,323	10	263	71	38,628	7,690	11,869	15	53	863	955	21,365	29,800	44,703	—	587
12. Elgin . . .	104,992	2,409	13,474	23,323	915	49	22	40,192	3,727	16,286	11	2	13	356	20,410	39,264	4,973	—	163
13. Fife . . .	246,450	12,614	30,048	40,957	1,047	1,854	24	86,564	13,640	27,369	27	37	206	1,091	47,179	62,083	48,849	—	1,835
14. Forfar . . .	253,378	9,453	17,116	27,271	18	1,375	66	45,239	9,943	16,167	51	211	206	1,091	47,179	62,083	48,849	—	1,835
15. Haddington . . .	115,804	146	7,855	30,714	821	13	35	39,584	8,252	11,084	1	1	1	10	165	29,153	16,242	—	1,013
16. Inverness . . .	126,302	491	12,233	31,630	82	464	36	44,986	3,847	18,401	—	—	—	—	28,662	27,155	39,140	—	914
17. Kinross . . .	131,872	267	1,454	6,884	16	15	1	7,417	1,009	2,680	—	—	—	—	7,373	12,288	7,872	1	141
18. Kirkcudbright . . .	177,078	287	704	31,421	111	168	1	23,672	2,628	14,280	69	41	234	71	17,171	67,080	59,418	—	188
19. Lanark . . .	347,474	1,466	4,342	44,651	60	1,472	22	50,391	9,405	8,270	31	66	437	1,865	16,864	61,137	116,048	—	394
20. Leithgow . . .	23,359	—	2,879	10,991	18	713	5	18,032	2,616	3,914	10	1	35	41	4,900	12,850	21,168	18	383
21. Linlithgow . . .	104,968	—	5,901	31,453	278	—	23	37,278	788	4,071	—	—	—	281	17,147	30,875	2,188	—	78
22. Orkney . . .	43,965	—	2,900	7,758	—	—	—	10,560	2,376	765	—	—	—	—	6,022	13,895	41,886	—	1,302
23. Shetland . . .	42,010	7,004	24,414	8,057	272	3,115	6	10,363	1,006	4,820	—	—	—	—	268	13,895	41,886	—	1,302
24. Peebles . . .	844,467	7,004	24,414	8,057	272	3,115	6	10,363	1,006	4,820	—	—	—	—	268	13,895	41,886	—	1,302
25. Perth . . .	133,586	9,765	21,111	70,331	12	4,119	73	105,119	21,414	36,187	26	11	147	1,007	59,767	84,609	1,237	—	321
26. Renfrew . . .	93,756	2,756	211	13,984	12	479	6	17,477	6,665	2,082	97	7	1	197	97,540	32,792	60,856	—	2,267
27. Ross & Cromarty . . .	180,907	1,406	11,941	32,094	1,045	26	83	48,470	10,463	16,459	57	9	494	692	27,540	36,763	17,886	—	949
28. Roxburgh . . .	180,907	1,406	11,941	32,094	1,045	26	83	48,470	10,463	16,459	57	9	494	692	27,540	36,763	17,886	—	949
29. Selkirk . . .	23,228	16	771	4,442	—	—	—	5,280	224	2,812	—	—	—	—	3,280	8,097	4,702	—	41
30. Stirling . . .	113,977	3,041	4,781	19,609	65	2,342	17	38,755	4,723	4,883	2	7	1	386	9,686	25,888	46,640	114	1,596
31. Sutherland . . .	30,151	62	2,965	15,690	109	19	2	38,719	2,710	15,227	360	240	61	162	15,780	59,622	46,540	—	285
32. Wigtown . . .	145,947	2,106	2,612	38,515	106	878	7	38,719	2,710	15,227	360	240	61	162	15,780	59,622	46,540	—	285
Total . . .	4,788,127	73,976	264,120	1,637,254	7,933	19,977	1,297	1,408,887	137,061	486,987	1,822	1,393	5,478	15,705	697,446	1,455,745	1,159,358	182	21,514



TABLE No. 2.—NUMBER OF HORSES, CATTLE, SHEEP, AND PIGS, IN EACH COUNTY OF SCOTLAND

COUNTY.	HORSES (Including Ponies).			CATTLE.			SHEEP.			Pigs.	
	Used solely for Agriculture, &c.	Kept solely for Breeding.	Total.	Cows and Heifers in Milk or in Calf.	Other Cattle.		Total.	1 Year Old and above.	Under 1 Year.		
					2 years of Age and above.	Under 2 Years of Age.					
1. Aberdeen . . . . .	20,245	6,506	26,851	41,318	35,892	74,956	152,106	100,396	37,387	137,693	7,240
2. Argyll . . . . .	4,072	3,123	7,204	22,865	15,882	21,709	59,976	717,204	304,744	1,021,948	8,768
3. Argyll . . . . .	6,084	2,703	8,787	43,568	14,965	30,369	68,932	225,694	186,490	412,184	12,164
4. Banff . . . . .	6,907	1,820	8,727	12,943	6,225	21,388	40,259	30,565	15,565	46,130	2,857
5. Berwick . . . . .	4,142	1,270	5,412	2,417	4,943	8,211	16,571	160,118	117,783	277,901	3,873
6. Bute . . . . .	815	332	1,147	3,280	1,684	2,788	7,652	27,058	15,367	42,425	630
7. Caithness . . . . .	8,958	1,219	10,177	8,813	3,088	9,845	19,746	68,188	30,781	98,969	1,559
8. Clackmannan . . . . .	606	188	794	1,349	867	1,167	3,383	6,965	3,434	10,399	1,473
9. Dumfriesshire . . . . .	1,268	597	1,865	6,676	2,068	3,794	12,538	48,620	25,076	73,596	897
10. Dumfries . . . . .	5,238	2,176	7,414	16,206	15,222	24,098	55,576	925,907	191,381	1,117,288	10,286
11. Edinburgh . . . . .	3,257	722	3,979	10,765	3,718	4,424	18,907	102,139	68,423	170,562	5,308
12. Elgin . . . . .	4,054	1,132	5,186	6,832	3,618	12,581	23,091	33,567	18,335	52,202	2,667
13. Fife . . . . .	7,650	2,532	10,202	9,098	13,205	17,431	39,674	44,010	28,868	72,873	5,229
14. Forfar . . . . .	8,451	1,992	10,443	11,685	15,251	19,368	46,304	85,754	37,103	122,857	5,132
15. Haddington . . . . .	3,192	561	3,753	1,807	3,331	2,899	8,237	67,410	44,476	111,886	2,480
16. Inverness . . . . .	2,150	8,938	20,208	9,406	21,673	51,287	82,957	509,160	202,750	711,910	2,897
17. Kinross . . . . .	3,363	1,040	4,903	6,736	5,595	12,876	25,207	23,468	8,540	32,308	2,186
18. Kirkcubright . . . . .	719	332	1,051	1,045	1,574	3,044	5,763	17,376	10,590	27,966	461
19. Kirkcudbright . . . . .	3,701	1,775	5,476	11,685	13,603	17,175	42,463	254,398	127,476	381,874	5,019
20. Lanark . . . . .	6,497	2,298	8,795	33,273	12,058	19,862	65,192	137,169	80,394	217,563	6,110
21. Leithgow . . . . .	1,537	624	2,161	3,637	3,737	5,833	10,937	18,662	5,923	24,585	1,675
22. Leithgow . . . . .	380	248	628	1,794	689	2,472	5,955	16,180	4,923	21,108	720
23. Orkney . . . . .	4,689	1,411	6,100	9,101	3,982	12,333	25,416	16,305	13,387	29,692	8,312
24. Shetland . . . . .	4,239	4,468	8,707	6,620	5,430	10,844	19,384	49,328	28,956	78,284	3,717
25. Peebles . . . . .	909	275	1,184	1,991	1,198	2,745	5,934	117,231	82,381	199,612	7,119
26. Perth . . . . .	10,886	3,457	14,343	19,556	23,378	36,507	79,721	480,161	231,423	694,584	7,615
27. Renfrew . . . . .	2,907	1,023	3,930	14,945	3,315	5,917	24,677	22,750	12,706	35,456	1,199
28. Ross and Cromarty . . . . .	6,700	1,700	8,400	17,862	8,929	15,944	42,755	253,558	107,678	361,236	5,631
29. Roxburgh . . . . .	3,642	848	4,490	4,655	5,190	7,191	16,976	288,689	219,940	508,629	3,574
30. Selkirk . . . . .	3,627	69	3,696	860	693	1,076	2,629	96,166	71,073	167,239	335
31. Stirling . . . . .	3,127	1,503	4,630	9,923	9,061	10,365	29,349	75,406	43,495	118,901	1,532
32. Sutherland . . . . .	2,214	523	2,737	5,639	2,940	4,686	12,595	174,007	61,490	235,497	1,165
33. Wigton . . . . .	4,068	1,817	5,885	17,959	8,032	14,153	40,144	80,419	46,548	126,967	7,412
Total . . . . .	141,332	52,681	194,013	387,195	253,967	433,124	1,099,286	4,651,116	2,420,972	7,072,063	120,925

TABLE No. 3.—QUANTITIES AND VALUES OF THE IMPORTS OF LIVE CATTLE, SHEEP, AND SWINE, 1875 TO 1879.

	QUANTITIES.					VALUES.				
	1875.	1876.	1877.	1878.	1879.	1875.	1876.	1877.	1878.	1879.
Live Cattle, . . . . .	No.	No.	No.	No.	No.	£	£	£	£	£
Live Sheep, . . . . .	262,684	271,576	201,183	233,462	247,783	4,885,462	4,800,440	3,817,499	5,695,702	4,689,491
Live Swine, including Suckling Pigs, . . . . .	983,632	1,041,329	874,065	892,125	944,553	2,153,750	2,236,962	2,107,496	2,171,994	2,332,524
	72,170	49,558	30,087	55,911	52,305	255,076	172,727	87,599	294,703	158,131
Total, . . . . .	1,271,506	1,356,463	1,005,265	1,201,498	1,245,022	7,326,283	7,200,119	6,012,564	7,458,299	7,075,386

TABLE No. 4.—QUANTITIES AND VALUES OF THE IMPORTS OF BEEF AND PORK (SALTED), BACON AND HAMS, &amp;c., 1875 TO 1879.

	QUANTITIES.					VALUES.				
	1875.	1876.	1877.	1878.	1879.	1875.	1876.	1877.	1878.	1879.
Meat—	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	£	£	£	£	£
Beef, salted, . . . . .	130,638	241,083	200,618	220,816	212,577	837,201	476,020	410,251	420,077	418,854
Beef, fresh or slightly salted, . . . . .	34,943	172,368	463,837	508,307	563,270	97,135	467,560	1,276,141	1,946,235	1,318,374
Unenumerated, salted or fresh, . . . . .	144,934	92,556	130,178	145,981	153,234	419,019	281,880	388,033	428,064	440,725
Preserved other than salted, . . . . .	171,373	283,065	460,003	439,900	567,577	562,196	587,085	1,434,234	1,315,701	1,690,060
Pork, salted and fresh, . . . . .	389,683	373,807	303,734	389,439	441,279	590,356	510,789	603,249	639,462	691,392
Bacon and Hams, . . . . .	2,638,875	3,181,569	2,820,462	4,295,151	4,917,631	6,932,470	8,611,329	6,889,854	8,662,310	8,330,223
Total, . . . . .	3,437,446	4,349,149	4,401,902	5,999,594	6,892,253	9,085,873	11,534,513	11,007,162	12,538,390	13,689,533
Fish, . . . . .	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	£	£	£	£	£
Poultry and Game (see Value), . . . . .	540,060	966,119	1,071,802	995,983	1,160,140	1,266,577	1,459,974	1,640,939	1,541,530	1,632,937
Butter, . . . . .	1,467,570	1,639,402	1,637,403	1,708,517	1,789,721	328,044	328,044	319,694	400,023	432,239
Cheese, . . . . .	1,627,748	1,351,204	1,633,920	1,968,859	2,045,399	8,562,054	9,718,226	9,543,532	9,953,532	10,379,451
Lard, . . . . .	540,344	562,174	562,204	908,005	840,319	4,709,503	4,297,763	4,771,393	4,946,686	3,824,017
Eggs, . . . . .	741,223,560	738,026,040	751,185,600	733,714,720	766,707,540	1,694,769	1,578,721	1,471,829	1,787,574	1,420,551
Total, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	2,559,390	2,620,896	2,473,577	2,511,096	2,293,720
	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	19,000,543	19,913,068	20,220,184	21,144,563	20,005,315

TABLE No. 5.—QUANTITIES AND VALUES OF THE IMPORTS OF WHEAT AND WHEAT FLOUR, 1875 TO 1879.

	QUANTITIES.					VALUES.				
	1875.	1876.	1877.	1878.	1879.	1875.	1876.	1877.	1878.	1879.
Wheat.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	£	£	£	£	£
Wheat Flour.	51,376,517	44,454,657	54,299,800	49,906,484	59,591,795	27,510,469	23,178,011	33,885,437	27,438,444	31,468,171
	6,136,083	5,969,821	7,877,903	7,823,079	10,728,252	4,870,257	4,741,515	6,303,982	6,784,197	8,501,949
Total.	58,012,600	50,414,478	61,647,103	57,734,563	70,320,047	32,380,726	27,919,526	40,694,419	34,217,641	39,970,120

TABLE No. 6.—QUANTITIES AND VALUES OF THE IMPORTS OF BARLEY, OATS, RYE, MEAL, AND MALT, 1875 TO 1879.

	QUANTITIES.					VALUES.				
	1875.	1876.	1877.	1878.	1879.	1875.	1876.	1877.	1878.	1879.
Barley.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	£	£	£	£	£
Oats.	11,049,476	9,772,945	12,959,526	14,158,919	11,546,314	4,635,044	3,747,085	5,396,019	5,542,503	4,804,469
Indian Corn.	12,435,838	11,211,019	12,910,035	12,774,420	13,471,660	5,406,768	4,020,450	4,992,879	4,537,605	4,496,927
Peanut Beans.	20,438,490	39,963,869	30,477,818	41,673,906	38,148,879	8,119,957	12,702,092	9,854,512	12,595,402	9,818,601
Rye.	5,073,909	6,218,805	6,110,985	3,680,300	4,948,687	2,314,434	2,561,852	2,331,130	1,468,146	1,032,277
Buckwheat.	310,013	132,866	241,269	342,395	307,253	125,835	45,653	96,232	125,291	91,858
	118,163	37,789	61,424	45,813	42,753	42,420	13,281	23,006	16,067	14,823
Total.	49,425,684	67,366,243	62,761,057	72,689,753	65,725,026	20,645,053	23,750,513	22,693,787	24,305,074	20,808,455
Barley Meal.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	£	£	£	£	£
Oatmeal.	227	821	511	485	2,417	109	828	231	166	811
Indian Meal.	56,592	166,631	153,413	762,083	645,923	41,611	106,847	103,880	485,888	391,002
Rye Meal.	7,376	7,703	2,713	41,747	37,080	12,080	15,471	17,264	32,276	25,535
Peanut Meal and Bean Meal.	5,414	17,115	47,463	56,322	8,345	2,391	6,820	17,624	20,986	8,122
Buckwheat Meal.	—	297	16	995	696	—	12	12	442	251
Meal unenumerated.	20	33	16	16	92	24	50	22	18	82
	13,479	22,255	8,896	5,711	4,112	4,392	12,744	4,083	2,384	1,969
Total.	83,013	224,875	213,033	897,384	698,670	60,997	142,399	148,116	542,160	422,862

TABLE No. 7.—AVERAGE PRICES OF VARIOUS KINDS OF ANIMALS, DEAD MEAT, AND PROVISIONS, 1875 TO 1879.

Kinds of Animals, Dead Meat, &c.		1875.	1876.	1877.	1878.	1879.
Animals—Oxen and Bulls from all countries.	. each	£18 10 7	£17 17 11	£18 19 6	£22 12 2	£21 17 6
" Sheep, including lambs, from all countries.	"	2 4 4	2 2 9	2 8 3	2 8 8	2 7 8
Bacon—From all countries.	per cwt.	2 12 3	2 13 6	2 7 10	1 18 7	1 14 4
Hams—From all countries.	"	2 10 5	2 19 9	2 13 11	2 8 1	2 3 9
Beef, salted—From all countries.	"	1 19 6	1 19 6	1 19 2	1 13 1	1 14 6
" Admiralty prices (American).	"	2 9 4½	2 6 0½	2 8 4	—	—
Pork, salted—From all countries.	"	3 4 0½	3 7 4½	3 10 4½	—	—
" Admiralty prices (Deftford).	"	2 3 2	2 2 0	1 19 7	1 13 1	1 19 11
Butter—From all countries.	"	3 6 2	3 7 10½	3 8 3½	2 15 5½	5 1 6
Cheese—From all countries.	"	3 15 10	3 17 1	3 16 7	5 10 10	2 9 9
Potatoes—From all countries.	"	2 11 10	2 15 4	2 17 8	2 10 3	0 5 9
Eggs—From all countries.	"	0 4 6	0 5 9	0 5 11	0 5 5	0 7 2
Lard—From all countries.	per 120	0 3 3	0 8 4	0 7 11	0 7 8	1 13 10
Milk—Bethlehem Hospital prices.	per gallon	3 0 6	2 16 3	2 9 8	1 19 4	—
		0 1 3	0 1 3	0 1 3	0 1 3	—

TABLE No. 8.—RETURN OF THE AVERAGE PRICES OF WOOL IN EACH OF THE YEARS FROM 1860 TO 1879.

Years.	Australian.	South African.	English Fleeces.	Years.	Australian.	South African.	English Fleeces.
	Per lb. s. d.	Per lb. s. d.	Per lb. s. d.		Per lb. s. d.	Per lb. s. d.	Per lb. s. d.
1860	1 9½	1 5½	—	1870	1 8½	1 8½	1 1
1861	1 7½	1 1½	—	1871	1 2½	1 1	1 1
1862	1 7½	1 2½	—	1872	1 3	1 4½	—
1863	1 6½	1 2½	—	1873	1 8½	1 4½	1 11
1864	1 9½	1 5½	—	1874	1 9½	1 4½	—
1865	1 7½	1 3½	2 0 to 2 1	1875	1 4½	1 8½	1 6½
1866	1 8½	1 5½	1 9 " 1 10	1876	1 8½	1 8½	1 5½
1867	1 7½	1 5½	1 7	1877	1 8½	1 8½	1 4½
1868	1 1 2½	1 2½	—	1878	1 2½	1 8½	1 3½
1869	1 2½	1 2½	1 3½	1879	1 2½	1 2½	1 0½

TABLE No. 9.—AVERAGE PRICES (PER IMPERIAL QUARTER) OF HOME-GROWN WHEAT, BARLEY, AND OATS IN THE WEEKLY MARKET OF EDINBURGH FOR THE YEARS 1876, 1877, 1878, 1879, AND 1880.

Weekly Market day Wednesday.	WHEAT.										BARLEY.					OATS.				
	1876.	1877.	1878.	1879.	1880.	1876.	1877.	1878.	1879.	1880.	1876.	1877.	1878.	1879.	1880.	1876.	1877.	1878.	1879.	1880.
January	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7
February	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7
March	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7
April	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7
May	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7
June	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7
July	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7
August	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7
September	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7
October	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7
November	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7
December	s. d. 42 6	s. d. 45 11	s. d. 55 1	s. d. 39 2	s. d. 43 1	s. d. 34 0	s. d. 34 10	s. d. 33 3	s. d. 33 10	s. d. 33 3	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7	s. d. 27 9	s. d. 25 6	s. d. 27 7	s. d. 21 6	s. d. 26 7

## APPENDIX (A).

### PROCEEDINGS AT BOARD MEETINGS.

#### MEETING OF DIRECTORS, 4TH FEBRUARY 1880.

*Present.*—Lord Arthur Cecil, Sir Michael R. Shaw Stewart of Blackhall, Bart.; Sir Haw Dalrymple of North Berwick, Bart.; Sir James R. Gibson-Maitland of Clifton Hall, Bart.; Mr Dickson of Corstorphine; Mr Dingwall, Ramornie; Mr Scott Dudgeon, Longnewton; Mr Forman, Duncrahall; Mr Gillon of Wallhouse; Mr Hope, Duddingston; Mr Irvine of Drum; Mr Kirkwood, Killermont; Mr Elliott Lockhart of Borthwickbrae; Mr Mackenzie of Portnure; Mr Mylne, Niddrie Mains; Mr Ritchie of Middleton; Mr Smith, Stevenson Mains; Mr Smith, Whittinghame; Mr J. Turnbull Smith, C.A.; Mr Williamson of Lawyers; Professor Wilson; Dr. Aitken.—Mr Smith, Stevenson Mains, and afterwards Sir James R. Gibson Maitland, Bart, in the chair.

Mr F. N. MENZIES reported apologies for the absence of Mr Cunningham, Tarbroch; Mr Harris, Barnhill; Mr Kennedy of Sundaywell, Brandleys; Mr Ralston, Glamis House; Mr Smith, chief magistrate, Kelso; Mr Walker of Bowland, C.B.

*PERTH SHOW, 1879.*—Letters were submitted from Sir John Ogilvy, Bart., convener of Perth; Mr Whyte Melville of Bennochy, convener of Fife; and Mr Young of Cleish, convener of Kinross, acknowledging the votes of thanks passed at last general meeting.

*DATE OF CALCULATING THE AGE OF CATTLE.*—It was resolved that the dates of calving of cattle should be calculated from 1st December in place of 1st January, and that this alteration should commence at the Stirling Show in 1881.

*CHEMICAL DEPARTMENT.*—The remits from the last general meeting in regard to Mr W. P. Hope's motion at Perth, and as to procuring premises for a laboratory, were referred to the chemical department.

*ESSAYS AND REPORTS.*—Several new subjects were added to the Premium-Book for the current year.

#### MEETING OF DIRECTORS, 3d MARCH 1880.

*Present.*—Lord Arthur Cecil; Sir James Ramsay Gibson-Maitland of Clifton Hall, Bart.; Mr Dingwall, Ramornie; Mr Scott Dudgeon, Longnewton; Mr Forman, Duncrahall; Mr Hope, Duddingston; Mr Irvine of Drum; Mr Kennedy of Sundaywell, Brandleys; Mr Mylne, Niddrie Mains; Mr Ritchie of Middleton; Mr Smith, chief magistrate, Kelso; Mr Smith, Stevenson Mains; Mr Smith, Whittinghame; Mr John Turnbull Smith, C.A.; Professor Wilson; and Dr Aitken.—Mr Smith, Stevenson Mains, in the chair.

Mr F. N. MENZIES reported apologies for the absence of Sir George D. Clerk of Penicuik, Bart.; Mr Hendrie of Larbert; Mr Hog of Newliston; Mr Elliott Lockhart of Borthwickbrae; Mr Murray of Dolerie; Mr Ralston, Glamis House; and Mr Walker of Bowland, C.B.

*KELSO SHOW, 1880—Railway Accommodation.*—The SECRETARY read a letter from Mr Walker, general manager of the North British Railway, stating that the company have secured possession of the necessary land for additional accommodation at Kelso, and that the plan is in course of preparation by their engineer.

*Stallion for District of Show.*—The SECRETARY reported that Messrs Thomas Penny, Bartlehill; John Usher, Stodrig; and Adam Smith, Stevenson Mains (the judges appointed to select the stallion to serve in the district connected with the Kelso Show) had, at the competition at Glasgow on the 24th February, awarded the prize of £150

to Mr Joseph Bulloch, Cockmuir, Springburn, for his bay horse "Zulu." The charge for service to be £2, and groom's fee 2s. 6d., to be paid at the end of the season, and £2 extra for every foal. The horse to be shown at Kelso market on the first Friday in April, and to commence then to travel the district—the counties of Berwick, Roxburgh, Selkirk, and Peebles. The travelling to cease on 10th July, but the horse to remain at Kelso till after the general show—viz., 30th July.

**STIRLING SHOW, 1881.**—It was resolved that Galloway cattle at the Stirling Show in 1881 must be entered in the Herd-Book, or the exhibitor must produce evidence that his animal is eligible to be entered therein.

**DEATH OF MR SCOTT PLUMMER AND MR HUGH KIRKWOOD.**—The following resolutions were unanimously adopted: "That the Directors of the Highland and Agricultural Society of Scotland desire to express the deep and sincere regret with which they have received the intimation of the death of Mr Charles Scott Plummer of Sunderland Hall, one of their number, and their sense of the obligations which the Society owed to him while acting as a member of the board during the years 1863 to 1867, and from 1878 till the period of his death.

"That the Directors of the Highland and Agricultural Society of Scotland have to record their deep regret at the loss which the Society has sustained by the death of Mr Hugh Kirkwood, Killermont, a member of the board, and their sense of the assistance rendered by him as a judge of stock at the Society's general shows, and the interest he uniformly took in the general affairs of the Society.

"That the Directors request the Secretary to transmit a copy of these resolutions to Mr Charles Henry Scott Plummer and Mrs Hugh Kirkwood respectively, with their respectful condolence and sympathy upon the occasion of the painful bereavement which they and their families have sustained."

#### MEETING OF DIRECTORS, 7TH APRIL 1880.

**Present.**—Mr Dickson of Corstorphine; Mr Dingwall, Ramornie; Mr Scott Dudgeon, Longnewton; Mr Hog of Newliston; Mr Hope, Duddingston; Mr Murray of Dolerie; Mr Mylne, Niddrie Mains; Mr Ritchie of Middleton; Mr Smith, Whittinghame; Professor Wilson; Dr Aitken—Mr Hog of Newliston in the chair.

Mr F. N. MENZIES reported apologies for the absence of Sir George D. Clerk of Penicuik, Bart.; Mr Irvine of Drum; Mr Kennedy (of Sundaywell), Brandleys; Mr Elliott Lockhart of Borthwickbrae; Mr Smith, Stevenson Mains; Mr John Turnbull Smith, C.A.

**THE LATE MR HUGH KIRKWOOD.**—A letter was read from Mrs Kirkwood, Killermont, expressing her deep sense of gratitude to the Directors for their sympathy with her in her sudden and great bereavement.

**ARGYLL NAVAL FUND.**—On the recommendation of the Committee in charge of the Argyll Naval Fund, a fifth naval cadet (Mr Louis Wentworth Chetwynd) was added to the list of recipients.

**AGRICULTURAL EDUCATION.**—The reports of the Agricultural and Forestry examinations were submitted, from which it appeared that the written examinations were held on the 29th and 30th, and the oral examinations on the 31st March, and resulted in two candidates passing for the diploma, four for first and four for second class certificates in agriculture; two for first and one for second class certificates in forestry. The two prizes of £6 and £4, given by the Society in books to the class of agriculture in the University of Edinburgh, were also announced to have been awarded after special examination.

**VETERINARY DEPARTMENT.**—It was reported that the examinations for the Society's veterinary certificate took place on the 5th, 6th, and 7th instant, and resulted in twelve out of twenty passing. The preliminary examination of younger students was held at the same time, when twenty-six entered their names and twenty-five passed.

**KELSO SHOW 1880.**—Letters to the conveners of the counties connected with show—Berwick, Roxburgh, Selkirk, and Peebles—and to the chief magistrate of Kelso, in regard to the nomination of the local committee, were submitted and approved of.

**STIRLING SHOW 1881.**—The board approved of letters being addressed to the conveners of the counties embraced in the district of the show—Stirling, Dumharton, and Clackmannan, and the western division of Perthshire—aneut the auxiliary subscription.

**CASE OF THE QUEEN AGAINST HOPKINS.**—A circular was submitted from Mr H. J. Hine, secretary of the Shorthorn Society of Great Britain and Ireland, sending an extract from the minutes of a meeting of the council, held on the 2d March, in which was embodied a report of the case against Hopkins, who was tried before the Lord Chief-Justice for receiving money under false pretences. The prosecution was con-

ducted by the Birmingham Agricultural Exhibition Society. Hopkins exhibited at the show of the said society in March 1875 a bull called Grand Patriot Second, and he represented that it was a pure-bred shorthorn bull, and certified that it had a pedigree of five crosses. The bull gained a prize of £20. It was afterwards discovered that the bull was not pure-bred, and that the pedigree was fabricated by Hopkins, and the charge in the indictment was for fabrication of this false pedigree and receiving the prize of £20 awarded on the faith of that pedigree. Hopkins was found guilty, with a recommendation to mercy, and the Lord Chief-Justice sentenced him to imprisonment with hard labour, for three calendar months.

#### MEETING OF DIRECTORS, 5TH MAY 1880.

*Present.*—Sir James R. Gibson-Maitland of Clifton Hall, Bart.; Professor Balfour; Mr Scott Dudgeon, Longnewton; Mr Forman, Duncrahill; Mr Hog of Newliston; Mr Kennedy (of Sundaywell), Brandleys; Mr John Ord Mackenzie of Dolphinton; Mr Murray of Dolerie; Mr Mylne, Niddrie Mains; Mr Smith, Stevenson Mains; Mr Smith, Whittinghame; Mr Williamson of Lawers; Professor Wilson; Dr Aitken—Mr Smith, Stevenson Mains, in the chair.

Mr F. N. MENZIES reported apologies for the absence of the Marquis of Lothian, K.T., president; Lord Polwarth; Sir George D. Clerk of Penicuik, Bart.; Mr Cunningham, Tarbreoch; Mr Dickson of Corstorphine; Mr Dingwall, Ramornie; Mr Hope, Duddingston; Mr Irvine of Drum; Mr Elliott Lockhart of Borthwickbrae; Mr Ralston, Glamis House; Mr Ritchie of Middleton; Mr John Turnbull Smith, C.A.; Mr Smith, chief magistrate, Kelso; and Mr Walker of Bowland, C.B.

THE LATE MR M'DOUGAL, GRANTON MAINS.—Before proceeding to the business on the programme, the Directors resolved to record in their minutes the deep regret with which they had received the intimation of the death of Mr Alexander M'Dougal, Granton Mains, Edinburgh, and their sense of the assistance which the Society had received from him as a Director and member of the Veterinary Committee; and instructed the Secretary to send a copy of the resolution to Mr M'Dougal's relatives.

DATE OF CALVING OF GALLOWAY CATTLE.—At the request of the Galloway Cattle Society, the Directors agreed that the date of calving of Galloway cattle exhibited at the Society's general and district shows should be as from on and after the 1st of January.

GAELIC SOCIETY OF PERTH.—A letter was submitted from Mr Alexander Fraser, Perth, intimating that a Gaelic Society had been formed in Perth, and sending a copy of the constitution and rules of the association, which has for its object the moral and intellectual improvement of the members and the cultivation of the Gaelic language.

#### MEETING OF DIRECTORS, 2D JUNE 1880.

*Present.*—Lord Arthur Cecil; Hon. Henry Constable Maxwell Stuart of Traquair; Sir James R. Gibson-Maitland of Clifton Hall, Bart.; Mr Cunningham, Tarbreoch; Mr Dickson of Corstorphine; Mr Dingwall, Ramornie; Mr Scott Dudgeon, Longnewton; Mr Harris, Burnhill; Mr Irvine of Drum; Mr Elliott Lockhart of Borthwickbrae; Mr Mylne, Niddrie Mains; Mr Smith, chief magistrate, Kelso; Mr Smith, Stevenson Mains; Mr Smith, Whittinghame; Mr Campbell Swinton of Kilmurghame; Dr Aitken—Mr Smith, Stevenson Mains, in the chair.

Mr F. N. MENZIES reported apologies for the absence of the Earl of Haddington; Lord Polwarth; Sir George D. Clerk of Penicuik, Bart.; Mr Gillon of Wallhouse; Mr Hope, Duddingston; Mr Kennedy (of Sundaywell), Brandleys; Mr Ralston, Glamis House; Mr John Turnbull Smith, C.A.; Mr Walker of Bowland, C.B.; and Professor Wilson.

DATE OF CALVING OF AYRSHIRE CATTLE.—On a letter being read from the Hon G. R. Vernon, Auchens House, Kilmarnock, the compiler of the Ayrshire Herd-Book, the board resolved that the date of calculating the birth of Ayrshire cattle exhibited at the Society's general and district shows should be as from on and after the 1st of January.

FINANCE.—The following notice of motion by the Hon. George Waldegrave Leslie for the general meeting on the 16th of June was read:—"That, considering the very large amount of capital accumulated and still accumulating in the hands of the treasurer of the Highland Society, it is desirable that more money should be annually



spent by the Directors of the Society in promoting the objects for which the Society was originally founded, and for the promotion of which it now holds its royal charters."

**CHEMICAL DEPARTMENT.**—At the meeting of the board on the 5th of May, Mr Scott Dudgeon, Longnewton, stated that as he had made arrangements to spend the month of June on the Continent, he could not be present at the general meeting on the 16th of that month, and he wished to postpone bringing forward his motion (of which he had given notice)—that Mr Hope's motion, which was carried at Perth, be rescinded—till the Kelso showyard meeting in July, Mr Hope, to whom he had spoken, being agreeable to the postponement. The board acceded to the request, and Mr Dudgeon undertook to send the terms of his motion before the June meeting of the board, in order that there may be ample time to consider it previous to the Kelso meeting.

The second part of the motion relating to Field Experiments will be found at page 15; and the first part with reference to Chemical Analyses at page 21.

#### MEETING OF DIRECTORS, 16th JUNE 1880.

*Present.*—Lord Napier and Ettrick, K.T.; Sir James R. Gibson-Maitland of Clifton Hall, Bart.; Mr Cunningham, Tarbreoch; Mr Dingwall, Ramornie; Mr Gillon of Wallhouse; Mr Hope, Duddingston; Mr Kennedy (of Sundaywell), Brandleys; Mr Elliott Lockhart of Borthwickbrae; Mr Mackenzie of Portmore; Mr Mylne, Niddrie Mains; Mr Ralston, Glamis House; Mr Ritchie of Middleton; Mr Smith, Stevenson Mains; Mr Smith, Whittinghame; Mr John Turnbull Smith, C.A.; Mr Campbell Swinton of Kimmerghame; Mr Walker of Bowland, C.B.; and Dr Aitken.

Apologies were reported for the absence of the Earl of Haddington; Mr Dickson of Corstorphine; Mr Murray of Dolerie; Mr Smith, chief magistrate, Kelso; Major Wauchope of Niddrie Marischal; and Mr Williamson of Lawers.

The business had reference principally to the subjects to be brought before the general meeting of this date.

#### MEETING OF DIRECTORS, 21st JULY 1880.

*Present.*—Lord Napier and Ettrick, K.T.; Sir Hew Dalrymple of North Berwick, Bart.; Sir James R. Gibson-Maitland of Clifton Hall, Bart.; Mr Graham Binny, W.S.; Mr Dickson of Corstorphine; Mr Dingwall, Ramornie; Mr Scott Dudgeon, Longnewton; Mr Gillon of Wallhouse; Mr Elliott Lockhart of Borthwickbrae; Mr Mackenzie of Portmore; Mr Mylne, Niddrie Mains; Mr Ritchie of Middleton; Mr Smith, Stevenson Mains; Mr Smith, Whittinghame; Mr John Turnbull Smith, C.A.; Mr Walker of Bowland, C.B.; Mr Williamson of Lawers; Professor Wilson—Lord Napier and Ettrick in the chair.

Mr F. N. MENZIES reported apologies for the absence of the Earl of Haddington, Mr Irvine of Drum, Mr Kennedy of Sundaywell, Brandleys; Mr Murray of Dolerie; and Mr Smith, chief magistrate, Kelso.

**DATE OF CALVING OF CATTLE.**—The petition of the Carrick Farmers' Society, praying that the resolution recently adopted by the Highland Society as to calculating the dates of calving of cattle from 1st December instead of 1st January might be rescinded and the former rule reverted to, which was remitted by the last general meeting to the Directors, was considered.

The Board resolved that the date of calving of all cattle exhibited at the Society's General and District Shows should be counted as from on and after the 1st January, except those of the polled Angus or Aberdeen breed, which are to be calculated as from on and after 1st December.

#### SPECIAL MEETING OF DIRECTORS, 1st SEPTEMBER 1880.

*Present.*—Mr Dingwall, Ramornie; Mr Scott Dudgeon, Longnewton; Mr Gillon of

Mr F. N. MENZIES reported apologies for the absence of Lord Napier and Ettrick, K.T.; Mr Graham Bimby, W.S.; Mr Dickson of Corstorphine; Mr Irvine of Drum; Mr Kennedy of Sundaywell, Brandleys; Mr Murray of Dolerie; Mr Smith, chief magistrate, Kelso; and Professor Wilson.

**CHEMICAL DEPARTMENT.**—In conformity with the recommendation from the general meeting of the Society held at Kelso on the 28th of July, a Committee of ten members was nominated to consider and report on the subject-matter embraced in Mr Scott Dudgeon's proposed resolutions.

**GENERAL SHOWS.**—According to the present rotation, the General Show for 1882 should be held at Inverness, but, on a suggestion by the Secretary, the Board agreed to recommend to the next general meeting to hold the Show for that year at Glasgow, and to postpone Inverness till 1883, with the view of holding the General Show at Edinburgh in 1884, the year of the centenary of the Society. The Secretary also submitted a scheme for altering the order in which the districts are visited, so that three Shows should be held between Edinburgh and Glasgow, in place of five and one, as at present.

**INTERNATIONAL EXHIBITION OF WOOL, &c.**—The SECRETARY stated that he had received a letter from Mr P. J. Simmonds, Superintendent of the International Exhibitions Department, Crystal Palace, Sydenham, S.E., intimating that the Directors of the Crystal Palace Company intend to hold an international exhibition next year of wool and woollen manufactures and their allied industries.

#### MEETING OF DIRECTORS, 3D NOVEMBER 1880.

*Present*—The Earl of Haddington; Lord Reay; Lord Polwarth; Sir James R. Gilson-Maitland of Clifton Hall, Bart.; Mr Cunningham, Tarbruech; Mr Dingwall, Ramornie; Mr Scott Dudgeon, Longnewton; Mr Gillon of Wallhouse; Mr Hope, Duddingston; Mr Irvine of Drum; Mr Elliott Lockhart of Northwickbrae; Mr Murray of Dolerie; Mr Mylne, Niddrie Mains; Mr Ritchie of Middleton; Mr Smith, chief magistrate, Kelso; Mr Smith, Stevenson Mains; Mr Smith, Whittinghame; Mr John Turnbull Smith, C.A.; Mr Campbell Swinton of Kimmerghame; Mr Walker of Bowland, C.B.; Mr Williamson of Lawers; Professor Wilson; and Dr Aitken—Mr Smith, Stevenson Mains, in the chair.

Mr F. N. MENZIES reported apologies for the absence of Mr Dickson, of Corstorphine; Mr Kennedy of Sundaywell, Brandleys; and Mr Ralston, Glamis House.

Before proceeding with the business on the programme, the following resolutions were passed:—

**THE LATE MR KENNETH MACKENZIE, C.A.**—That the Directors of the Highland and Agricultural Society of Scotland desire to express the deep and sincere regret with which they have received the intimation of the death of Mr Kenneth Mackenzie, C.A.; and their sense of the obligations which the Society owed to him as examiner in book-keeping under the Society's Educational Charter since 1857, and as Auditor of Accounts for a period of twenty years.

**THE LATE MR ORL OF OVER WHITTON.**—That the death of Mr John Ork of Over Whitton having been communicated to the Directors of the Highland and Agricultural Society of Scotland, they resolved to record their sorrow for his loss, and their sense of his services as a member and a Director of the Society.

**PURSE SHOW, 1879.**—The premiums awarded for two-year-old polled Angus or Aberdeen and Galloway heifers, and for mares in foal, at the late Show at Perth (payment of which has been suspended till birth of produce was certified), were reported to have been finally decided as follow:—*Polled Angus or Aberdeen Heifers*—1 and 3, John Hannay, Gavenwood, Banff, for "Corriamulzie II." (3415) and "Kate of Glenbarry IV." (3512); 2, William J. Taylor, Holhemay House, Huntly, for "Kate Darling" (3573). *Galloway Heifers*—1, 2, and 3, the Duke of Buccleuch and Queensberry, K.G., for "Alice III. of Drumlanrig" (2988), "Harriet IX. of Drumlanrig" (2980), and "Princess II. of Drumlanrig" (2990). *Mares in Foal*—1, Robert Loder, Whitebury, Towcester, for "Jessie," 2, William Brook, Barns of Clyde, Yoker, for "Lily," 3, Thomas Muirhead (Crookedstone), Townhill Store, Dunfermline, for "Young Jessie," 4, no reward—none of the other animals having produced foals in terms of the regulations.

**ROTATION OF GENERAL SHOWS.**—The SECRETARY stated that, in accordance with the instructions given at the Special Meeting of the Board held on the 1st of September, he had communicated to the Conveners of all the counties connected with the Glasgow and Inverness districts the proposal to hold the Show at Glasgow in 1882, and at Inverness in 1883, with the view of holding the General Show at Edinburgh in 1884, the year of the centenary of the Society. The result was that there were no objections

to the proposal from those counties and towns which have replied, but that Cromarty and Sutherland and the town of Inverness had sent no answer.

**DISTRICT COMPETITIONS.**—The premiums awarded for brood mares in the district of Auchtermuchty, at the competition held there in 1879, were announced to have been finally adjudged as follow:—1st and 3d, James Blyth, Leckiebank; 2d, James Thom, Leden Urquhart.

#### MEETING OF DIRECTORS, 1st DECEMBER 1880.

*Present*—The Earl of Haddington; Lord Arthur Cecil; Lord Reay; Sir Alexander Muir Mackenzie of Delvine, Bart.; Professor Balfour; Mr Graham Binny, W.S.; Mr Cunningham, Tarbreoch; Mr Dickson, of Corstorphine; Mr Dingwall, Ramornie; Mr Scott Dudgeon, Longnewton; Mr Dundas of Arniston; Mr Gillon of Wallhouse; Mr Maxtone Graham of Cultoquhey; Mr Hope, Duddingston; Mr Irvine of Drum; Mr Elliott Lockhart of Borthwickbrae; Mr Mackenzie of Portmore; Mr Mylne, Niddrie Mains; Mr Smith, Whittinghame; Mr J. Turnbull Smith, C.A.; Mr Walker of Bowland, C.B.; Mr Williamson of Lawers; Professor Wilson—The Earl of Haddington, and afterwards Lord Reay, in the chair.

Mr F. N. MENZIES reported apologies for the absence of the Marquis of Lothian, K.T., president; Lord Polwarth; Mr Ralston, Glamis House; Mr Smith, Stevenson Mains; Mr Smith, chief magistrate, Kelso.

**THE LATE MR KENNETH MACKENZIE AND MR JOHN ORD.**—Letters were read from Mrs Kenneth Mackenzie and Mrs John Ord conveying their grateful thanks to the Directors for the expressed appreciation of their late husbands' services to the Society.

**ROTATION OF SHOWS.**—A letter was submitted from Mr Alexander Dallas, town-clerk, Inverness, sending extracts from minutes of meetings of the Magistrates and Town Council of Inverness disapproving of the proposed postponement of the Inverness Show from 1882 to 1883.

A letter was reported from Mr William Bartlemore, County Buildings, Paisley, stating that Renfrewshire approved of the proposal to hold the General Show at Glasgow in 1882.

#### SPECIAL MEETING OF DIRECTORS, 29th DECEMBER 1880.

*Present*—Professor Balfour; Mr Dickson of Corstorphine; Mr Forman, Dunera-hill; Mr Gillon of Wallhouse; Mr Maxtone Graham of Cultoquhey; Mr Hope, Duddingston; Mr Kennedy of Sundaywell, Brandleys; Mr Mackenzie of Portmore; Mr Murray of Dolerie; Mr Mylne, Niddrie Mains; Mr John Turnbull Smith, C.A.; Mr Campbell Swinton of Kimmerghame; Mr Walker of Bowland, C.B.; Dr Aitken.

Apologies were reported for the absence of Lord Napier and Ettrick, K.T.; Mr Cunningham, Tarbreoch; Mr Dingwall, Ramornie; Mr Dundas of Arniston; Mr Irvine of Drum; Mr Elliott Lockhart of Borthwickbrae; Mr Ralston, Glamis House; Mr Smith, chief magistrate, Kelso; and Professor Wilson.

The business had reference to the nomination of office-bearers.

#### MEETING OF DIRECTORS, 5th JANUARY 1881.

*Present*—Lord Polwarth; Sir Alexander Muir Mackenzie of Delvine, Bart.; Mr Dickson of Corstorphine; Mr Dingwall, Ramornie; Mr Scott Dudgeon, Longnewton; Mr Forman, Dunera-hill; Mr Gillon of Wallhouse; Mr Maxtone Graham of Cultoquhey; Mr Hope, Duddingston; Mr Elliott Lockhart of Borthwickbrae; Mr Mackenzie of Portmore; Mr Mylne, Niddrie Mains; Mr Ralston, Glamis House; Mr Smith, Stevenson Mains; Mr Smith, Whittinghame; Mr John Turnbull Smith, C.A.; Mr Campbell Swinton of Kimmerghame; Mr Walker of Bowland, C.B.; Major Wauchope of Niddrie Marischal; Dr Aitken—Mr Smith, Stevenson Mains, in the chair.

Mr F. N. MENZIES reported apologies for the absence of Lord Napier and Ettrick, K.T.; Mr Irvine of Drum; Mr Kennedy of Sundaywell, Brandleys; Mr Ritchie of Middleton; Mr Smith, chief magistrate, Kelso; Professor Wilson.

**OFFICE-BEARERS.**—The SECRETARY reported that the names of the noblemen and gentlemen to be proposed by the Directors at the General Meeting on the 19th current

to fill the vacancies in the list of Office-Bearers for 1881 had been published, in terms of the Bye-Laws.

**LOUPING-ILL AND BRAXY.**—A memorial from the Teviotdale Farmers' Club in regard to Louping-ill and Braxy, which was postponed at last meeting, was, on the motion of Mr Elliott Lockhart, seconded by Lord Polwarth, referred to a Committee, consisting of Professor Wilson, Professor Williams, Dr Aitken, Mr Grieve, Skelfhill; Mr Elliot, Blackhough; Rev. John Gillespie, Mouswald Manse; Mr Elliott Lockhart of Borthwickhae; and Mr Smith, Whittinghame, for consideration and report—Mr Elliott Lockhart, convener—with power to add to their number. The Committee, in the first place, to report the nature of the course they would recommend to adopt, and to give an estimate of the cost the enquiry is likely to involve.

**FOOT-AND-MOUTH DISEASE.**—The Board resolved to memorialise Her Majesty's Privy Council on the outbreak of Foot-and-Mouth Disease in England, and to request that the Local Authorities be warned to take immediate steps under the Contagious Diseases (Animals) Act to prevent the spread of that disease to Scotland, and if necessary to stop the transit of cattle from England into Scotland.

**CHEMICAL DEPARTMENT.**—The Report by the Special Committee was submitted to the Directors, and the Secretary was instructed to advertise that copies could be had on application to him.

**GENERAL MEETING.**—The programme of business for the Anniversary General Meeting on the 19th current was arranged.

**NEW MEMBERS.**—The list of candidates for admission as members was submitted.

**GENERAL SHOWS.**—*Stirling Show 1881.*—The report of the meeting of members held at Stirling on the 17th December was submitted, from which it appeared that a motion to increase the first prize for agricultural stallions from £35 to £50 was approved of, subject to the decision of the Directors.

The Board resolved to adhere to the premium list as submitted.

*Glasgow Show, 1882.*—The list of classes of stock, as prepared by the Committee on General Shows, was approved of by a meeting of members, held at Glasgow on the 15th December, subject to the following additions and alterations, suggested for the consideration of the Directors:—First, That in Ayrshires the family prize and the section for cows and heifers in calf be deleted, and the following added—1, Cow in milk or in calf of any age, bred by exhibitor; 2, cow in calf, calved before 1st January 1879; 3, heifer in calf, calved on or after 1st January 1879. Second, That in horses there should be the following additional sections:—1, Family Prize—the family to consist of five animals, foaled before 1st January 1880 (male or female, the offspring of one sire), not necessarily the property of one person; 2, Family Prize—the family to consist of five animals, foaled on or after 1st January 1880 (male or female, the offspring of one sire), not necessarily the property of one person; 3, mare or gelding shown in harness, regularly worked in a town, and not the property of a farmer; 4, stallion for agricultural purposes, to serve in the district of the Show in season 1882.

The Board adopted the suggestions, with exception of No. 3.

**IMPLEMENT DEPARTMENT.**—The recommendations by the Machinery Committee for the rearrangement of this department were reported, and the Directors agreed to give the proposals a trial. See p. 20.

## MEETING OF DIRECTORS, 19th JANUARY 1881.

*Present*—Lord Arthur Cecil; Lord Napier and Ettrick, K.T.; Sir Alexander Muir Mackenzie of Dalvine, Bart.; Mr Cunningham, Turbrooch; Mr Dingwall, Ramornie; Mr Scott Dudgeon, Longnewton; Mr Gillon of Wallhouse; Mr Maxtone Graham of Cultoquhey; Mr Hope, Duddingston; Mr Irvine of Drum; Mr Kennedy of Sundaywell, Brandleys; Mr Elliott Lockhart of Borthwickhae; Mr Mackenzie of Portmore; Mr Murray of Dollerie; Mr Mylne, Niddrie Mains; Mr Rulston, Glamis House; Mr Ritchie of Middleton; Mr Smith, Stevenson Mains; Mr Smith, Whittinghame; Mr John Turnbull Smith, C.A.; Mr Campbell Swinton of Kimmerghame; Professor Wilson—Lord Napier and Ettrick, K.T., in the chair. Apologies were reported for the absence of Mr Hog of Newliston; and Mr Smith, chief magistrate, Kelso.

The business had reference principally to the subjects to be brought before the general meeting of this date.

# PROCEEDINGS AT GENERAL MEETINGS.

GENERAL MEETING, 16TH JUNE 1880.

The Right Hon. Lord NAPIER and ETTRICK, K.T., Vice-President, in the Chair.

ELECTION OF MEMBERS.—112 new members were balloted for and elected.

BYE-LAWS RELATIVE TO DIRECTORS.—Mr Walker of Bowland said—By the Society's charter of incorporation all bye-laws made, declared, or altered require also to be confirmed in and by the succeeding general meeting. The following bye-laws relating to the election of ordinary and extraordinary Directors were adopted by the general meeting in January last; and I now, in terms of the charter, submit them to this meeting for confirmation:—"The Society shall annually, at the general meeting in January, choose out of the ordinary members a board of thirty Directors, special regard being had to the convenience of one-third of that number for attending meetings of the board held in Edinburgh. The Society shall also at the same meeting choose twenty extraordinary Directors, of whom at least ten out of the whole number to be resident in the district in which the Show of the year is to be held." The bye-law which regulates the duration of office has been altered to the effect that the ten senior extraordinary Directors shall retire annually.

The bye-laws were confirmed.

KELSO SHOW.—Mr Gillon of Wallhouse said—I have the honour to report that the General Show at Kelso will be held on Tuesday the 27th of July and three following days, and that all the arrangements are in active operation and most satisfactory progress. The entries closed on the 11th, and the following is a statement of the head of stock, &c., at Kelso, in 1863, 1872, and on the present occasion.—

	1863.	1872.	1880.
Cattle, . . . . .	245	274	275
Horses, . . . . .	127	214	228
Sheep, . . . . .	532	565	488
Swine, . . . . .	49	56	42
Poultry, . . . . .	261	291	244
Implements, . . . . .	1101	1777	1578
Premiums, . . . . .	£1800	£1888	£2671

Through the kindness of Sir George Scott Douglas the Show will be held within the grounds of Springwood Park, which has every convenience from locality and facility of access. In accordance with the usual practice, the Commissioners of Supply appointed certain gentlemen to represent their respective counties in the General Committee of Management. The following are the names of those nominated:—*Berwickshire*.—The Earl of Lauderdale; Mr Nisbet of Lambden; Sir Hugh Hume Campbell, Bart.; Sir George Houston Boswall, Bart.; Sir John Marjoribanks, Bart.; Mr Roy of Nenthorn; Mr Cotesworth of Cowdenknowes; Mr Turnbull of Abley St Bathans; Mr Allan of Peelwalls; Mr Rutherford, Printonan; Mr Torrance, Sisterpath; Mr Shaw, Skaithmuir; Mr Calder, Little Swinton; Mr Hood, Coldstream

—*Mr Lang of Broadmeadows; Mr Lang, yr. of Broadmeadows; Mr Pringle of Whyt-*

Thomson, The Lee; Mr Alston, Hyndfordwell; Mr Johnstone, Kingledores; Mr Linton, Glenrath; Mr Wilson, Darnhall Mains; Mr Blackwood, Bahiels; Mr Riddell, Howford; and Mr Forrest, Edston. *Town of Kelso*.—In addition to Mr Smith, chief magistrate, who is one of the extraordinary Directors of the Society, the

town of Kelso will be represented by Mr Darling, banker; Mr Slight, junior magistrate; Mr James Tait, W.S.; Mr James Johnston; Mr Gilbert Aitchison; Mr Brunton, Broomlands; Mr J. H. Rutherford; and Dr Edward Johnson, Forest Field. A large and influential deputation of Directors and other office-bearers, headed by the Marquis of Lothian, K.T., the President, will also attend during the Show. A meeting of the General Committee was held at Kelso on Friday last, when the following sub-committees were appointed:—*Admission of Stock*.—Mr Munro, Fair-  
 rington, convener; Mr Robertson, Ladyrig; and Dr Johnson, Kelso. *Forage Fairs*.—  
 Mr Burn, Ednam, convener; Mr Scott, Spylaw; and Mr Kay, Linton Bankhead.  
*Police*.—Lord Polwarth, convener; Mr Elliott Lookhart of Borthwickbrae, and Mr Ord  
 of Over Whilton. *Banquet and Ball*.—Sir John Marjoribanks of Lees, Bart., con-  
 vener; the Duke of Roxburgh; Mr Brunton, Broomlands; Mr Smith, senior magis-  
 trate; Mr Roy of Nenthorn; Mr Tait, Kelso; Mr Campbell Swinton of Kimmerghame;  
 Sir George Wallace-Griffith, Bart.; Sir George Houston Boswall, Bart.; and Mr Elliot,  
 yr. of Wolfelee. *Accommodation of Strangers*.—The Kelso Committee.—Mr Smith,  
 convener. The business of the Show will begin on the morning of Tuesday, 27th July,  
 by a meeting of the General Committee and Judges, previous to the admission of the  
 public at eleven. The Directors have arranged to adopt turnstiles for the admission  
 of the public, so that the members will be relieved from taking money at the gates.  
 In the evening the Directors and judges will dine in the Cross Keys Hotel, the head-  
 quarters of the Society. On Wednesday the general meeting of members takes place  
 in the yard at 1.30. The Marquis of Lothian will, as President, occupy the chair at  
 that meeting, as well as at the public banquet, which will be held the same evening in  
 the Corn Exchange. On the evening of the following day (Thursday) the usual ball  
 will be held. The recommendation by the deputation appointed to visit the Kilburn  
 Show, that the Society should have a members' club-room, with ladies' and gentlemen's  
 lavatories attached, has been acted on for Kelso, and to its members, on production  
 of their tickets, will be entitled to introduce their friends. In addition, there will be the  
 ordinary refreshment rooms for the public and attendants in charge of stock. The  
 North British Railway has put in hand a large addition to the station accommodation,  
 which should prevent the block-up there was on the last occasion. Admission tickets  
 have been sent to all members residing in the district embraced in the Show—the  
 counties of Berwick, Roxburgh, Selkirk, and Peebles. If any should have been  
 omitted, they will be supplied on sending notice to the Society's office in Edinburgh.  
 Members residing in other localities must apply before the 17th of July. On this  
 occasion the Directors have resolved to issue season tickets to non-members, the charge  
 for which will be £1, to include admission to the judging and horse-ring gallery.  
 The ticket will bear the name and be signed by the party to whom it has been granted.  
 It will be forfeited if presented by any other than the one in whose name it is issued,  
 and the name published. In addition to the subscriptions from the counties embraced  
 in the district of the Show already reported, the Kelso Committee have, through Mr  
 Smith, chief magistrate, intimated a contribution of £50 from the town of Kelso  
 towards the funds of the Society, as an expression of the interest the inhabitants take  
 in it, and of their desire for the success of the forthcoming show.

The report was adopted.

**PETITION FROM THE CARRICK FARMERS' SOCIETY.**—Mr Gillon then read the following  
 petition from the Carrick Farmers' Society:—"Unto the Highland and Agricultural  
 Society of Scotland,—The petition of the Carrick Farmers' Society, humbly sheweth:  
 That your petitioners observe that your Society have recently resolved that, in the  
 year 1881, the dates of calving of cattle are to be counted as from 1st December  
 instead of 1st January: That your petitioners are of opinion that the change  
 embodied in this resolution effects no improvement, while it may result in disad-  
 vantage to many breeders: That the date hitherto fixed and understood—namely, 1st  
 January—has in the past met with general approval, and should be adhered to: Your  
 petitioners, therefore, pray that the resolution referred to recently adopted by your  
 Society may be rescinded, and the former rule reverted to and re-adopted. Signed in  
 name and by authority of this Society, "DAVID BROWN, Secretary."

It was agreed to remit the petition to the Directors.

**CHEMICAL DEPARTMENT.**—Mr MACKENZIE of Portmores said—It will be in the  
 recollection of members that at the general meeting in January last the resolution of  
 the general meeting at Perth—"That the Society subsidise their chemist, so that he  
 would be able to give the members analyses at the same rates as local associations do"  
 —was remitted back to the Directors for further consideration, and that Mr Scott  
 Dudgeon gave notice that at the next general meeting he would move that the  
 resolution be rescinded. The Directors at their first meeting thereafter referred the  
 subject to the committee in charge of the chemical department. That committee  
 reported that they had already considered the resolution to the fullest extent, and  
 recommended that no further action should be taken in the matter in respect of the  
 notice of motion by Mr Dudgeon. At a recent meeting of the board, Mr Dudgeon

stated that, as he had made arrangements to spend the month of June on the Continent, he could not be present at this general meeting, and he wished to postpone bringing forward his motion till the Kelso showyard meeting. The Directors acceded to the postponement, which accounts for the motion not being on the programme of business before the present meeting. It will also be in remembrance that at the last general meeting the directors were empowered to look out for suitable premises for a laboratory to enable the chemist to carry on his analyses in connection with the Society's experimental stations. After inspecting various premises, it was found that if additional accommodation could be got at the laboratory in Clyde Street, it would be more convenient. Miss Dick was accordingly communicated with, and she most readily agreed to lease to the Society the additional rooms required.

The report was approved.

**REPORT OF CHEMIST REGARDING EXPERIMENTAL STATIONS.**—Dr AITKEN said:—Since the last general meeting the publication of the "Transactions" enabled me to lay before the Society the details of last season's barley crop much more fully than can conveniently be done here. At that time the analysis of the crop was well advanced, and I expected that a short review of some of the more important results would form the subject of this report. Since then, however, increased accommodation and means of analysis have been placed at my disposal, enabling me to carry out the investigation on a much larger scale. I have therefore determined to repeat the whole analysis, and have been engaged upon it for about a month; but it will be some time before it is far enough advanced for publication. The crop at present in the ground is Italian rye grass, which was sown with the barley last year. On neither of the stations has any manure been applied to this crop. It was considered inexpedient to apply undissolved manures as a top-dressing on grass; and to omit these and apply only soluble manures where these were being used would be a departure from the plan originally established, and which, though it might increase the crop, would not advance the objects of the investigation. On the other hand, the withholding of all manure for a season would enable the residual effects of former manures to be made manifest at Pumpherston, and would still further reduce the fertility of the station at Harelaw, and bring it into a condition more favourable for future experiments. It is satisfactory to notice that both these objects are being accomplished. An important change has been made on the course of cropping on the 1-112th acre plots. Hitherto these have been under the same crop as the larger plots at both stations; but the first year's cropping showed that the piece of ground set apart for the small plots at Pumpherston was not sufficiently uniform to yield reliable results. It was accordingly put out of cultivation last season, in order to have its defects remedied; and when this had been accomplished in a very thorough manner, by lifting the entire soil, mixing it together, and respraying it on a well-stirred and regularly-drained subsoil, the committee resolved not to sow it in grass in the spring, but to begin again with the turnip crop, as in 1878, and continue the rotation thus begun. It was also resolved to do the same with the small plots at Harelaw, so that the cropping on the small plots might be the same each year on both stations, and serve as a check upon each other. By this arrangement the four years' rotation will be maintained over the whole stations, but it will be two years later on the small plots than on the large ones. There will thus be annually two kinds of crop on each station—turnips and grass the one year, barley and oats the next. Two advantages are gained by this means. In the first place we shall not be so dependent, as formerly, on favourable weather for the whole of our annual crops; and secondly, what is still more important, we have now the opportunity of repeating the experiments with each crop of the rotation every two years, either on the large or small scale, instead of requiring to wait for four years, as was the case under the original arrangement. The results already obtained with the turnip crop, both in the field and in the laboratory, are of so much interest and promise to be of such importance that it was felt to be a misfortune to have to wait four years for their confirmation. I have also to notice that, through the kindness of Mr Sinart, Liberton Park, I have obtained the use of a portion of a field adjoining my house, in which I have set down a series of experiments exactly the same as those on the small plots at the Society's stations. The manures for the 1-112th acre plots at all three stations were made from the same materials, and mixed with the greatest care in the laboratory, and their correctness determined by analysis. One or two slight changes have been introduced in the character of the manures, so as to render the investigation more complete, but these will be noticed in detail along with the results of the cropping. I may also mention that I am carrying on a twofold series of experiments with grass in bag-pots similar to those employed for the barley experiments last year. They are mostly duplicates of plots at the Society's stations, and are being grown in the open air at Liberton.

**AGRICULTURAL EDUCATION.**—Mr MYLNE, Niddrie Mains, reported that the annual examinations held under the Society's educational charter were held on the 29th, 30th, and 31st March, and that the following gentlemen passed:—*For Diploma*—William

Craig, Monkton Hill, Monkton, Ayrshire; and Wm. Martin, Dardarroch, Dumfries. *For First-Class Certificate*—Wm. Brown, Watten Mains, Caithness; Alexander Inglis, Tyninghame, Prestonkirk; James M'Laggan, Cobblehaugh, Dinnet, Aberdeenshire; and R. M. Malloch, Balhaldie, Braco, Perthshire. *For Second-Class Certificate*—Andrew Chapman, Breckonhill, Lockerbie; Jas. Sutherland, Wick; Wm. R. Tait, Wick; and Francis Underwood, Sywell Hall, Northampton. He also announced that Professor Wilson awarded, after special examination, the two prizes of £6 and £4 given by the Society in books to the Class of Agriculture in the University of Edinburgh, to (1st) Andrew Chapman, Dumfriesshire; and (2d) R. Colley Smith, Lanarkshire.

The report was adopted.

**FORESTRY DEPARTMENT.**—Mr MYLNE further reported that the forestry examinations were held on the same day as those under the Agricultural Education Charter, when the following candidates passed:—*For First-Class Certificate*—John M. Aitken (Grief), 24 St Andrew Square, Edinburgh; and Richard Henderson, The Grange, Kirkcudbright. *For Second-Class Certificate*—John M'Ewen, Yellow Cottage, Killin.

The report was adopted.

**VETERINARY EXAMINATIONS.**—Mr CAMPBELL SWINTON of Kimmerghame said—I have to report that the annual examination for the Society's veterinary certificate was held on the 5th, 6th, and 7th of April, and resulted in twelve out of twenty candidates passing. The preliminary examination of younger students was held at the same time, when twenty-six entered their names, and twenty-five passed. I would take this opportunity of reminding students of the profession that, according to the agreement made with the Royal College of Veterinary Surgeons, the Society is to cease holding examinations after April 1881.

The report was adopted.

On the motion of Mr MACKENZIE of Portmure, a vote of thanks was given to Lord Napier for presiding, and the proceedings terminated.

#### GENERAL MEETING AT KELSO, 28TH JULY 1880.

MOST NOBLE THE MARQUIS OF LOTHIAN, K.T., President, in the chair.

**THE FINANCES OF THE SOCIETY.**—The Hon. GEORGE WALDEGRAVE LESLIE moved—“That it is not desirable, in the best interests of the purpose for which the Highland and Agricultural Society of Scotland was founded, that so large a sum should be allowed to accumulate in the hands of the Treasurer; and that the Finance Committee should be requested to devise a scheme in terms of this resolution.” He had heard it said that he was to be a great spendthrift with the funds of the Society; but he begged to point out that in his motion there was not one word about expenditure. According to the charter the Society was founded, *inter alia*, for encouraging agriculture, and it was to continue to exist for that purpose. It was further stated in the charter that the Society might purchase, or hold for the use of the Society, lands, tenements, or any estate or interest therein, not exceeding the sum of £2000 of yearly rent in value. Well, as far as he could make out from the accounts, the annual income from investments was £2702, and from subscriptions £1500. He was informed—though he did not know how far it was true—that at one time there was in one of the charters a rule by which the Society was never at any time to possess more than £50,000. He found that there were at present invested in bonds, £21,220; in debenture stock, £4286; in bank stock, £33,231—making in all a capital sum of £58,746. He could not help thinking, in these days of agricultural and commercial distress, it was time those who guided the affairs of the Society should show that they could spend some of the funds of the Society in a little better manner, and be a little more lavish in their expenditure, instead of keeping up the capital. He thought they were already getting a little too defiant of public opinion as to how the money should be spent, and hints brought before them by some well-wishers of the Society did not always meet that cordial respect which they ought to receive. Among other things pointed to was the large subscriptions asked for from the counties in whose neighbourhood the show was held; to the high charges which were made in the yard for fodder; and he also thought the implement makers might receive a little more courtesy than they sometimes did, because, after all, in these days they must look to the improvement of implements to help them in carrying out a better cultivation of the land. They had still the great mission God gave to Adam to replenish and subdue the earth. They had got to replenish it with good honest manures, and he did not think this Society should be afraid of doing what the Royal Society did—to publish the names of those who sold to the poor farmer adulterated manures, and prosecute those parties for imposing bad and injurious manures on the public.



Mr SHAW, Skaithmuir, in seconding the motion, said he had heard a good deal about the penuriousness of the Society, and especially in respect to the way they treated attending members. This was the first time he had been summoned in that capacity, and he was never treated more shabbily in any yard he had been in. Why, they even grudged him a biscuit or a glass of beer. Their duties as attending members were to wait on the judges—and he must say that the judges took a considerable time in giving their decision—to go to the committee-room and sign the awards, to take the judges to the luncheon bar to get their refreshments, shake hands with them, and then retire.

Mr RUTHERFORD, Printonan, said he saw in the accounts of the Perth Show a sum of £309, 12s. for hotel expenses, and £543, 4s. 7d. for other expenses. He thought some explanation should be given to the meeting of these sums.

Mr MACKENZIE of Portmores said that in the absence of the Treasurer he had been asked to make a statement, on behalf of the Finance Committee, of the income and expenditure of the Society for the last two years. There was an opinion abroad that the Society was a rich one, and had a much larger income than was necessary to meet its ordinary expenditure; and further, that it laid by large sums each year. That was totally opposed to fact. For years no addition had been made to capital. They just balanced the expenditure by the income, taking one year with another, and looking to the state of the weather now, and the immense loss they should have upon this show, he thought it would be most imprudent that they should tie the Society down by an abstract resolution to spend a portion of their already far too small capital for the purposes of the Society. In the year 1877-78, the income consisted of three items—from investments, £2724; from subscriptions, £1849; and from the chemical stations, £38—making in all £4612. The expenditure, which included £1513 for the expenses of the establishment, £892 to district societies, and £540 for the report on Scottish agriculture to the Paris Exhibition, was £4730, leaving a loss of £118. Last year the income was £4547, and the expenditure £4271, leaving a surplus of £275; but as there was a loss on the Perth Show of £800, that wiped it out. With such a statement before them, he did not think the Society could be called rich, in the ordinary commercial sense of the word. He wished to point out also, that the income of £2702 from investments included the capitalised amount of the life members' subscription, which could not be put down at less than £15,000, yielding about £600 a-year, so that if that were deducted the income from investments would be brought down to £2000—the sum Mr Waldegrave Leslie thought it should be at.

The CHAIRMAN said he thought it well that such a statement should have been made on behalf of the Finance Committee, because it was very undesirable that such an idea should be widely spread that the finances of the Society were in a plethoric condition. It would be sure to lead to discontent. One form of that discontent they had already had from the gentleman who seconded the motion, who complained that he could not get a glass of beer and a biscuit in the yard for nothing. He thought it desirable that every courtesy should be extended to those who took so much trouble in the way of judging and performing other arduous duties. Mr Waldegrave Leslie spoke about spending the capital more lavishly, and that statement met with considerable approval. Most people, he supposed, would approve of capital being spent with a lavish hand, but then it had to be remembered that when the capital was spent they would have to replace it by asking them to put their hands into their pockets, or else the work which the capital performed would have to be left undone.

There being no amendment, the motion was then declared carried.

**CHEMICAL ANALYSIS AND FIELD EXPERIMENTS.**—Mr SCOTT DUGGON said he would move his motion in two parts—the first relating to chemical analysis, and the second to field experiments. (The first part will be found at page 21 and the second at page 15.) These proposals were founded on the assumption that this National Society, existing, as it did, purely for the promotion of agriculture, recognised it to be a duty to encourage the general use of chemical analysis as a guide in the purchasing of manures and feeding-stuffs. By more than one resolution the Society had pledged itself to action in this direction; and it was a field of action in which, it must be admitted, great good might be done. Farmers still required to be impressed with the fact that there was no other way of knowing anything about the value of manures, and, to a great extent, about feeding-stuffs as well, except through chemical examination; and that the only protection against imposition and overcharge in the purchasing of these was to have them submitted to chemical analysis. How facility for analysis could be most efficiently and economically placed within the reach of every farmer in Scotland became, then, a most important question for the consideration of this Society; and the accomplishment of this desirable end deserved its liberal support. He thought he might assert that the method in which this was to be accomplished had been already solved—viz., by the establishment of local or district analytical associations. The fact that, while a few years ago there were only one or two such associations in existence, there were now somewhere about thirty scattered over Scotland from Orkney to Berwick, was unmistakable proof that this system was the right one, and fulfilled its

purpose. His object, accordingly, was to get the Highland and Agricultural Society to recognise these district associations, and encourage them in their good work. By the expenditure of a comparatively small sum in the way proposed, this Society had an opportunity of conferring a substantial benefit on agriculture which it could in vain hope to do by the proposal to subsidise its own chemist in Edinburgh, so as to enable him to make analyses for its members at a reduced rate, or, indeed, by any alternative method that he had yet heard suggested. He was glad to be in the position of not being called upon to offer any arguments against the Perth resolution, seeing that its proposer, Mr Hope, and its seconder, Mr Glendinning, were prepared to its being rescinded, and were ready to accept the proposals he made in its stead. He might mention that all analytical associations had been communicated with, and the greater number of them had, at special meetings, considered his resolutions, and intimated their hearty approval of them; and the leading manure merchants also welcomed the movement with heartiness, being convinced that the adoption of it would place the trading in these stuffs on a much more satisfactory and solid footing. They would notice that, by this scheme, the principle of local self-government which had been found to work so efficiently and economically in this matter of analysis, was not interfered with, but encouraged, indeed enforced; at the same time, through the agency of this Society, the work of all the different local associations would be conducted on a uniform system, both as regards the nomenclature used in describing the ingredients of manures, and in their valuation.

Mr JOHN W. HOPE (in the absence of Mr W. P. Hope, Leith, through indisposition), seconded the motion, and in doing so read a statement on the subject by his father, the proposer of the motion carried at Perth—in the effect that the Society should subsidise their chemist, so that the members might have analyses of manures at the same rate as was charged by local analytical associations. He was desirous, he said, to testify his sympathy with the motion of Mr Scott-Dudgson, even though it was apparently a cancellation of the motion which he made last year at Perth. It was stated on that occasion, and since, that the large majority by which the motion was then carried was due to a feeling of dissatisfaction with the Directors. He most emphatically denied that any such feeling animated him or many who supported his motion. Their sole object was to obtain for struggling agriculture, at a time when it was peculiarly wanted, assistance towards the better management of its affairs by the much wanted scientific education without which he did not believe that agriculture in this country could possibly hold its own. The question was perhaps the most important which the Society had ever had to deal with, and it was peculiarly one with which the Society ought to be associated. He hoped, therefore, that the Directors would not only give their support to the motion, but by a hearty and prompt line of action, so as to give it immediate effect, would set at rest the murmurings of disappointment and dissatisfaction to which he had already referred. He felt bound to inform the meeting that the Manure Manufacturers' Association, which now comprised 90 per cent. of the trade in the United Kingdom, had been actively exerting itself towards the object which the motion had in view, and had come to an arrangement with the agricultural societies' chemists of the three kingdoms to adopt a uniform and simple form of analysis which would go far to aid farmers in becoming acquainted with the value of the articles they bought. He could vouch for it that the Association was most anxious to see this motion carried out, as they felt that as the trade was at present carried on they were oft-times grossly misunderstood and their goods very much undervalued.

Sir JAMES GIBSON MAITLAND of Clifton Hall, Bart., moved an amendment which, starting by way of preamble with the first head of the motion down to the words "resolved to rescind such resolution," proceeded:—"Remit the whole subject matter embraced in the reminder of Mr Scott-Dudgson's proposed resolutions to the Directors with the recommendation that they appoint a committee, composed one-half of their own body and one-half of members who are not on the directorate, to consider and report to a subsequent general meeting of the Society." He thought it would be a dangerous precedent if at a meeting held during a local show they passed any such resolutions.

Mr VILLIERS, Clowburn Hall, seconded the amendment. He thought the project, the importance of which they all recognised, could be carried out in a more useful and orderly manner, if remitted to a committee, than if the resolution was passed at a meeting where it could not be satisfactorily discussed.

Mr NICOLL, Littleton, regretted that the Directors would not accept the resolutions, as thereby they would have regained the confidence and goodwill of the membership, which to a great extent they had lost. Gentlemen who said "No" evidently forgot the tone and temper of the meeting which was held at Perth last year, and they were evidently unaware of the feeling which existed outside this hall that day. Mr Scott-Dudgson's proposals were not so wild and revolutionary as some gentlemen would lead them to imagine.

Mr SMITH, Whittinghame, supported the amendment, and indicated his belief that

if they passed these resolutions now, there would be no guarantee that they would not be overturned at the next general meeting. At the last meeting the "leaders of public opinion" were all in favour of subsidising their own chemist; now they wanted the money to go to the local associations.

Mr SCOTT-DUDGEON said he opposed the Perth motion.

Mr SMITH, continuing, said this was just a project to enable farmers to get analyses for nothing. It only cost them 5s. at present.

Mr DUDGEON—It cost 19s.

Mr SMITH—It only costs the individual members 5s.

Mr SCOTT-DUDGEON—2s. 6d.

Mr SMITH—And yet these associations came forward to ask a subsidy. It would be an improper application of the funds of the Society. The time analytical associations might be supported would be if they got into any actions at law with people for selling adulterated manure.

The CHAIRMAN said he was sorry to hear the remarks which had fallen from one of the speakers (Mr Nicoll), and still more sorry to see that they met with some approval from gentlemen present. That gentleman said the Directors had not the goodwill of a large portion of the members of the Society, but in saying so he believed he spoke entirely for himself. He was sorry that remark of his did not seem to meet with approval. He would recall to their minds that the Directors were appointed by the Society; and that if the members did not think they were doing their work in a satisfactory way they could, at the next annual meeting, elect other Directors who would do the work better. Reference had been made to the meeting at Perth, but he did not see any animus displayed then towards the Directors; and until he had better grounds for the charge which had been made against them he should not believe it.

Lord NAPIER and ETTARICK appealed to members to vote on the merits of the question, and not vote against the Directors because there was a certain measure of antagonism at present felt towards that body. He was bound to say that he thought there was a feeling of jealousy and want of sympathy on the part of outside members towards the Directors. That such was the case had reached him from a variety of quarters, but that feeling, if it existed, was founded on a misapprehension. The appointment of a committee composed one-half of directors and one-half of outside members, would be a valuable opportunity of bringing all parties into friendly contact, and establishing between them again a degree of sympathy which was perhaps not present on this occasion. For himself, he had great sympathy with the proposals of Mr Scott-Dudgeon, but thought it would be more prudent to pass them through the test of an examination by the committee.

Mr NICOLL pointed out that he said he personally regretted the existence of the feeling which, he said, existed outside the hall.

Mr LINDSAY, Meadowflat, considered that the amendment simply meant a shelving of the question.

The CHAIRMAN pointed out that the course taken at Perth had been productive of a year's delay.

Mr LINDSAY—Carry out the resolutions before any one has time to object.

Mr SCOTT, Spylaw, asked if Mr Scott-Dudgeon meant to retain section No. 6 in his resolution, about which there was a difference of opinion.

Mr SCOTT-DUDGEON, in reply, said that as the clause in question did not answer the purpose for which it was proposed, he should consent to its withdrawal. As he did not in any way wish to interfere with the usefulness of the Society in other directions, he should like to insert in clause 2 a paragraph to the effect that the amount to be given annually by the Society should not exceed £250. In the third clause he should insert for the words 5 or 10 per cent., 8 per cent.

Mr MARTIN, yr. of Auchindennan, while expressing his willingness to support the Directors, protested against the position advanced by Sir J. G. Maitland that a show-yard meeting was not a proper place for transacting business. It was the very place.

Sir JAMES GIBSON MAITLAND said that what he meant was that while he considered this showyard meeting most valuable for discussion, it might not be advisable to settle such a proposal here.

Mr MARTIN—That is exactly what I object to. The Edinburgh meetings were no doubt attended by very energetic members of the Society, but they were not practical farmers.

Lord REAY said that, with the limitations suggested by Mr Scott-Dudgeon, he did not see any reason why the Directors should not accept the resolutions. In the present condition of agriculture, he felt that the Directors should show that they had some goodwill and some energy to carry out things which were now most important.

Mr SMITH asked if members of the Highland Society who were not members of local analytical associations were to participate with them in the benefits of this subsidy?

Lord NAPIER objected to be asked to tie up the Society to give only £250 for such an object, as that might prove very inefficient.

Mr HADDON, Honeyburn, said it was evident there were details such as that suggested by Mr Smith which could best be settled by a committee.

Mr SCOTT-DUDGEON, in reply to Mr Smith, said the subsidy would be to local associations. It would be for the benefit of all who were not members of such associations to become so.

Sir James Gibson Maitland then offered to withdraw his amendment, but this being objected to by Sir William Baillie, a vote was taken on the point, with the result that the meeting declared the amendment must be put. On a division between the motion as amended and the amendment, 109 voted for the motion, and 127 for the amendment. The latter was therefore declared carried. The appointment of a committee was left to the Directors and Mr Scott-Dudgeon, it being understood that Mr Dudgeon would have the nomination of the outside members. The Rev. Mr Gillespie expressed a hope that the report would be put into the hands of members at least a fortnight before the general meeting.

The CHAIRMAN said there should be no difficulty about that.

Mr SCOTT-DUDGEON then moved—"In order to encourage members being practical farmers to make experiments with different manures in the field, the Society resolves to defray the cost of making the necessary analyses of soils, manures, and products for such experimentalists, provided they conduct their experiments under the direction or with the sanction of the Chemical Committee of the Society."

This was unanimously agreed to.

**SALARY OF THE CHEMIST.**—Mr MACKENZIE of Portmure submitted a proposal by the Directors to the following effect—"To appoint an assistant in the chemical laboratory at a salary of £120; to allow for a laboratory servant, whose time is only occasionally required, £20 per annum; and for apparatus, chemical re-agents, gas, and heating £150 per annum—in all, £290." The matter, he said, was briefly this—The Society agreed to give a salary of £300 to their chemist, Dr Aitken; but at the present moment he was enjoying no part of that salary, as it was entirely taken up with the expenses of the laboratory. He was sure that was not a position they wished to see their chemist placed in.

Mr J. LOGAN MACKIE, Glasgow, seconded the motion.

Mr LINDHAY, Meadowflat, objected to the vote until they had first a report of the work done by the chemist.

Mr SCOTT-DUDGEON, as a Director, could not consent to the motion until the chemist's duties were properly defined.

Mr MACKENZIE said he had no objection to remit the matter to the committee, on Mr Scott-Dudgeon's resolutions.

This being agreeable to the meeting, that course was followed.

This was all the business.

On the motion of LORD NAPIER and ETTRICK a cordial vote of thanks was given to the Marquis of Lothian for presiding, and the proceedings terminated.

#### GENERAL MEETING, 19TH JANUARY 1881.

The Right Hon. Lord NAPIER AND ETTRICK, K.T., Vice-President, in the chair.

The noble CHAIRMAN said that, before proceeding to the business of the meeting, he thought it was right that he should express his deep personal regret that he had been called to perform the duties of chairman in consequence of the absence of the Marquis of Lothian, who had been, to his own great regret, prevented from attending by the delicate state of his health at this time. He believed, in fact, that his Lordship had been ordered by his physicians to proceed to the Continent from that cause.

**NEW MEMBERS.**—The SECRETARY then read the list of 71 gentlemen who had been proposed as members of the Society, and who were unanimously elected.

**VOTE OF THANKS TO THE MARQUIS OF LOTHIAN.**—The noble CHAIRMAN said that, he was proceeding to vote on the election of office-bearers, it was his duty to propose a vote of thanks to the Marquis of Lothian, who this day ceased to be president of the Society. The period of four years during which the Marquis of Lothian had acted as their president had not been distinguished for any remarkable innovation or change, or any unprecedented incidents to which it was necessary that he should call their attention. During this year the Society had continued to prosper and flourish, to increase its numbers, and expand its financial means, although in the latter respect perhaps not in the degree they might reasonably desire. During this period the Society had continued to work in the well-approved grooves in which it has moved, for

the most part, up to the present time ; to take a part in the general improvements of the time, and to impel them by its assistance and by its example. Until the present year it had no great innovation, and no matter of controversy had arisen in their body. During the whole of this time the Marquis of Lothian had continued to show his interest in the Society by his careful and punctual attendance at all their meetings, their shows, and their festivals ; and he had endeared himself to those with whom he has been brought in contact by his unflinching kindness and courtesy. He had performed these duties on more than one occasion at the sacrifice, it might be said, almost of his health. At least, as he had been suffering, unfortunately, from the delicate state of his health, he had been obliged to make considerable exertions in performing his duties, for which they ought to be truly grateful. The Marquis of Lothian now retired. They trusted, however, that his relations with the Society were not severed, but only changed ; and they could assure his Lordship that he carried with him, wherever he might go, the warm feeling and gratitude of their meeting, and hearty sympathy for his welfare, and all the interests of himself and family in every relation of life. He begged to propose the following resolution :—" That the Most Noble the Marquis of Lothian, K.T., having presided over the Highland and Agricultural Society of Scotland for the period of four years prescribed by the charter, the thanks of the Society are eminently due to his Lordship for the zeal exhibited by him in promoting its efficiency and prosperity, for his unwearied attendance at its various public meetings and shows, and for the urbanity, readiness, and ability with which he has uniformly discharged the duties of his office."

**NEW OFFICE-BEARERS.**—The SECRETARY stated that the following noblemen and gentlemen were proposed for election, to fill the vacancies in the list of office-bearers for the current year :—*President.*—The Duke of Richmond and Gordon, K.G. *Vice-Presidents.*—The Duke of Montrose, the Earl of Mar and Kellie, the Earl of Dunmore, Charles Stirling Home Drummond Moray of Abercairny. *Ordinary Directors.*—Sir Windham C. J. Carmichael-Anstruther of Anstruther, Bart ; Sir James H. Gibson-Craig of Riccarton, Bart ; David Ainslie of Costerton ; John Balfour of Balbirnie ; Thomas Elliot, Blackhaugh ; Rev. John Gillespie, Monswald Manse ; Lieutenant-Colonel Hare of Calder Hall, Philipston House ; Gideon Pott of Knowesouth ; Walter Scott, Glendronach. *Extraordinary Directors.*—Lord Balfour of Burleigh ; Vice-Admiral Sir William Edmonstone of Duntreath, Bart. ; Sir Henry James Seton Stewart of Touchseton and Allanton, Bart. ; Sir James R. Gibson Maitland of Cliftonhall, Bart. ; Robert Anderson, Provost of Stirling ; Henry David Erskine of Cardross ; William Forbes of Callendar ; Colonel John Murray of Polmaise ; Alexander Smollett of Bonhill ; William Smythe of Methven.

The noble Chairman said that before proceeding to the election of a new President he might perhaps be permitted to make a few observations. In electing a President they might, he thought, ask themselves what were the characteristics and qualifications that they might reasonably expect in one who was fitted to preside over this intelligent, important, and influential Society. He thought that they might fairly say that they had a right to expect on the part of their President that he should fill a conspicuous social position, that he should be a man of unblemished life and character ; that he should be deeply identified with the welfare and the interests of the land, by property, by residence, by taste, and pursuits ; that he should if possible be in some degree a practical farmer ; and that he should be well known by his wide participation in public business to the various classes of his countrymen. Now if these things be true, although perhaps not a complete picture of what a president of the Society should be, he ventured to assert that that picture was exactly and perfectly represented in the life and character of the nobleman whose name he had to submit to the Society—namely, the Duke of Richmond and Gordon. The Duke possessed the highest rank, and, what was not indifferent to their countrymen, he was the principal representative of a family which had an ancient, and he might say almost a romantic, claim on the memory and affections of Scotchmen. And the Duke of Richmond and Gordon was not only practically versed in county and country business, but he had himself been a practical farmer, and was well known, particularly for his success in rearing sheep of the Southdown class, and also shorthorn cattle. In addition to that, his reputation generally for his knowledge of and interest in the land was such that on a recent occasion, when the late Government proposed the appointment of a royal commission to examine into the state of agriculture, the Duke of Richmond and Gordon was appointed with, as it were, the implied assent not only of his own party, but of the whole country, to occupy the position of President of that commission. To that he might add that in the high position which he had filled in the general affairs of the country, the Duke of Richmond and Gordon had constantly given proofs of the possession of a remarkable share of application, industry, energy, and good sense. They could not doubt that in accepting the position of President of this Society the Duke would be not merely a formal president, but an active and a suggestive director of their deliberations and of their fortunes. In fact they could not for a moment doubt

that they would largely benefit by the results of his intelligence and experience. Without further remarks, he would therefore propose that the Duke of Richmond and Gordon be elected President of the Society for the ensuing year.

The motion was cordially approved of.

The noble CHAIRMAN then put to the meeting for approval the names of the other office-bearers proposed.

The Hon. GEORGE WALDEGRAVE LESLIE suggested to the Directors that they should on a future occasion propose the Duke of Sutherland and the Master of Blantyre as Vice-Presidents of the Society.

The list of office-bearers was then unanimously adopted.

ACCOUNTS FOR 1879-80.—Mr MURRAY of Dolerie then laid on the table the accounts for the past year. It appeared that the income for the year amounted to £5168 16s. 10d., of which £2635 7s. 11d. was interest and dividends. The expenditure for the year amounted to £6872 1s. 6d., showing an excess over income of £1703 4s. 8d. The probable loss from the Kelso Show of last year is given as £1456, 14s. 4d. The amount of funds at 30th November last (including £5565, 7s. 7d. in the name of building fund, £500 for Tweeddale medal fund, and £1000 under the head of furniture) amounted in all to £69,187 17s. 8d.

The Hon. GEORGE WALDEGRAVE LESLIE asked what had been done in reference to a proposal that he had made that the Society should not hoard up so much money?

Mr MURRAY said with reference to the statement as to hoarding up money, that on two occasions—at the shows of Edinburgh and Glasgow—they had invested a surplus; but with the exception of these two occasions, and at Dumfries in 1878, the premiums had more than exceeded the monies received. He must call the Society's attention to the fact that, along with the increase of the capital, there had followed periodically an increase in the premiums.

ARGYLL NAVAL FUND.—Admiral MANTLAND DOUGALL of Scotsraig reported that the annual financial statement of this fund shows a total of £8069, 18s. 4d. The income amounted to £237, 1s. 6d., and the expenditure to £200 being £40 a year to five recipients.

KELSO SHOW, 1880.—Mr GILLON of Wallhouse said he had to state for the information of the meeting that the general show of the Society, held at Kelso in July last, was a most satisfactory one in all respects except from a pecuniary point of view. According to the accounts now on the table, the meeting would observe that the probable loss is estimated at £1456, being, he believed, the largest deficit ever sustained upon any show. The state of the weather had no doubt a great deal to do in preventing many of the general public from attending; but in all other respects the show was a decided success. He then moved the following votes of thanks to those who had so zealously afforded their co-operation in carrying out the objects of the meeting:—"1. That the thanks of the Society be given to the Most Noble the Marquis of Lothian, K.T., who, as President of the Society, attended the general show at Kelso in July last, for the lively interest his Lordship took in the proceedings of the show, and for the able and highly satisfactory manner in which he discharged the duties of chairman at the general meeting in the showyard and at the public banquet in the Corn Exchange. 2. That the thanks of the Society be given to the Commissioners of Supply for the counties of Berwick, Roxburgh, Selkirk, and Peebles, for the liberality with which the auxiliary fund has been provided. 3. That the thanks of the Society are due to Sir George H. Scott Douglas of Springwood Park, Bart., convener of the local committee elected by the counties of Berwick, Roxburgh, Selkirk, and Peebles, for allowing the show to be held on Bridge End Park; and to the individual members of that committee, for their co-operation in everything connected with the meeting. 4. That the thanks of the Society be given to James Smith, Esq., chief magistrate of Kelso, and the other members of the town committee, for the cordiality with which they afforded their assistance in the arrangements connected with the show, and for the liberal contribution in aid of the Society's expenses."

STIRLING SHOW, 1881.—Mr GILLON then said he had next to report that the arrangements for the show at Stirling were progressing satisfactorily. The period fixed for the show was from Tuesday, 26th, to Friday 29th July inclusive. The Directors had applied to the Woods and Forests Department for permission to hold the show on the King's Park, as had been done on former occasions. The premium list, as prepared by the General Show Committee and Directors, had been submitted to a meeting of members held at Stirling on the 17th of December, and again to the Board on the 5th of January, when premiums were recommended to the amount of £2250, being £390 above what had been offered at Stirling in 1873. The Directors had resolved to reduce the stall rent as follows:—Stallions, 30s., in place of 40s., to members; 40s., in place of 50s., to non-members. Poultry, 8s. and 5s., in place of 4s. and 6s.; while the allowance of forage for stock has been considerably increased. Now that turnstiles have been introduced for the admission of the public, the Directors recommend that there should be a uniform charge during each day of the show. The present rates are:—Tuesday,

10s.; Wednesday, 2s. 6d.; Thursday till one o'clock, 2s. 6d.; after one, 1s.; Friday till noon, 1s.; after twelve, 6d. The charges in future are to be:—Tuesday, 5s.; Wednesday, 2s. 6d.; Thursday, 1s.; Friday, 6d. The competition for the £100 prize for a stallion for agricultural purposes, to travel this season in the district of the show, would take place at Glasgow on the 22d of February. The Tweeddale Gold Medal would on this occasion be given for the best shorthorn bull in the yard.

**AGES OF SHORTHORN CATTLE.**—Mr GILLON, after submitting the above report, made a statement on a question to be raised under a motion by Mr Mollison, Dochgarroch Lodge, as to the date for calculating the ages of cattle. The conclusion of this statement was that the Directors, believing that it would be advantageous that this Society and the Royal English should adopt as near as possible the same date, considered that the meeting should be cautious in making the proposed alterations, and that the opinion of all the principal breeders of shorthorns should be obtained before the change was made.

Mr MOLLISON then moved as follows:—"That the ages of shorthorn cattle to be exhibited at the Society's shows shall, in like manner as polled Angus or Aberdeen, date from 1st December in place of 1st January, and that this rule shall come into operation at same time as that which now applies to polled Angus or Aberdeen." He stated that the 1st of January, although a well-defined period, being the commencement of the year, was not the commencement of the shorthorn breeding season, and marked no special term. Neither would it be said did the 1st December. That he readily granted. Martinmas would be preferred, but the 1st December having been accepted by the breeders of polled Angus, he would readily fall in with it. No breed of cattle came so early to maturity as shorthorns, and he thought this date would best suit calving of animals for show. A large number of communications had been received by him since the motion was made, speaking of the importance of early calves. Coupling that with the fact that most local societies in the north of Scotland had departed from the 1st January and adopted the earlier date, showed, he thought, the importance of the motion. It was quite different with regard to Ayrshires and Galloways. Their constitution and mode of bringing them up was different. Rather, however, than that there should be any doubt on the subject, he should most readily propose that a committee be formed to ascertain the wishes of shorthorn breeders throughout the whole members of the Society.

Mr ANDREW MITCHELL, Alloa, seconded the motion.

In answer to Mr Mollison,

Mr MENZIES, Secretary, stated that seventeen shorthorn breeders had written to him saying that they approved of Mr Mollison's motion, and three that they did not.

Mr MOLLISON thought that indicated pretty well what the feeling of the shorthorn breeders was.

Mr SMITH, Whittinghame, asked the Secretary to read any of the most prominent remarks.

Mr MENZIES said that those making the most prominent remarks were against the change.

Mr change; they did not give reasons. Mr Bruce in his letter said—"I hope the exhibitors will consider the matter well before they come to a conclusion on the subject, as I believe the present date is the most definite, and also the date to suit the large proportion of exhibitors. I give the following reasons for my belief:—"First, breeding should never be made subservient to showing, and as men are not bound to show all they breed, such only as can fulfil conditions as to age, &c., need be prepared. Second, a large proportion of even north-country shorthorns are calved in February, March, and April. Third, the Royal English Society have determined to fix 1st January as the date from which to calculate ages, and a uniform date at the national shows must be desirable."

Mr MOLLISON said that these were really English breeders, and he did not think they should be much guided by their opinion.

Sir THOS. GLADSTONE of Fasque, Bart., said that, as a breeder of polled cattle, he wished to state that until very lately he was under the same impression as Mr Mollison. At a recent meeting of the Kincardineshire Agricultural Society, he seconded a motion

doubt, therefore, there must be good reasons to influence in so remarkable a manner the intelligent farmers of a breeding district such as his. Their main objection, as he understood it was, that it was giving encouragement to the earlier breeding of cattle, and in that way tending to increase the destitution of milk before they could turn cattle out on the land. That was a very important consideration, it influenced the farmers of that district to a very great extent, and he thought it right therefore to express his recantation of opinion on the subject.



Mr MAXTON GRAHAM of Cultoquhey said that this was a matter which the Directors wished to keep open, it being one more for the Society itself to decide. He did not pretend to compete in authority with the mover and seconder, but he had long taken great interest in the rearing and breeding of shorthorns, and he had rarely found that animals dropped before the 1st January were materially better than those dropped after the beginning of the year. He would propose as an amendment that a committee be appointed to consider the question.

Mr SMITH, Whittinghame, thought the experience of the English Society truly should be theirs, and their desire to encourage anything that might lead to uniformity in the regulations of the national societies should lead them on the present occasion to pause, and not to go directly in the face of what the societies were doing. He moved the previous question.

Principal WILLIAMS seconded this motion, holding that as regards the promoting of the health of the future stock, it would be undesirable to encourage breeding from so young animals.

Sir JAMES GARDINER BAIRD called attention to the inconvenience which would arise from large agricultural societies adopting different periods from which to date the age of animals, and suggested that any committee appointed should be empowered to hold a conference at least with the Royal English and any other large society with the view of agreeing upon a date for the age of animals brought forward for judging.

The CHAIRMAN—Do you propose that the conference should be personal or by means of communication?

Sir JAMES GARDINER BAIRD—I leave that entirely to the discretion of the committee.

After some further discussion, in course of which it was suggested that any committee to be appointed should have power to reconsider the ages of the polled Angus as well as that of the other classes—a proposal which was opposed by Mr Ralston, Glamis; Sir William Forbes of Craigavar, Bart., and others—a motion that a committee be appointed by the Directors to consider and report on the ages of shorthorn cattle only was adopted.

SHROPSHIRE JUDGES.—The next motion on the programme was the following by Mr Dangerfield, Balboughty :—“That in view of the large and increasing entries of Shropshire sheep at our annual shows, the Directors secure the services of Shropshire breeders as judges of that class of stock.”

Mr DANGERFIELD stated that he understood the Directors had agreed to act as he proposed, and he therefore withdrew the motion.

INSPECTORS OF SHEARING SHEEP.—Mr CRAWFORD, Pitlowie, moved—“That two or more inspectors of shearing be appointed by the Directors to examine the sheep on their admission to the showyard, with instructions to mark any animal or animals which they find has been unfairly shorn; further, to cause a disqualification ticket to be nailed on the pen over their number, and to report the case or cases to the stewards or attending members.” He said it was often the case that an artist was employed to give a sheep a good outline.

Mr DUNDAS, Dunira, seconded the motion.

Mr MELVIN, Bonnington, said that unless the Society drew out special instructions for the guidance of the inspectors it would not be possible to carry out the proposal contained in the motion. It was a very difficult matter for a judge to decide what length of wool should be left.

Mr SMITH, Whittinghame, said he thought they should leave the matter as it stood, but ask the judges to give special attention to the subject.

Lord ARTHUR CECIL said that the great rogues that had been discovered in some places in regard to sheep shearing had led to the appointment of inspectors.

Mr SMITH, Stevenson Mains, said that the system adopted by the Royal Agricultural Society of appointing inspectors did not give satisfaction. He thought that the present regulations of the Society were sufficient if they were a little more strongly enforced. He moved the previous question.

Mr HOWATSON of Glenbuck seconded the amendment.

On a division, the previous question was carried by a large majority.

PROPOSED SHOW AT GLASGOW IN 1882.—Mr GILLON of Wallhouse then reported as follows :—From the publicity given in the newspapers to the proceedings at the Directors' meetings, the members present are no doubt aware that in accordance with the ordinary system of rotation the General Show of the Society would in 1882 be held at Inverness, and that the Directors have resolved to recommend to this meeting the substitution of Glasgow for Inverness in that year. The reason of this alteration is that the centenary of the Society is in 1884, and the Directors think that the show should be held in Edinburgh that year, as it would not do to have Edinburgh following Glasgow. It is therefore proposed to go to Glasgow in 1882, and have Inverness betwixt it and Edinburgh. As instructed by the Directors, the Secretary communicated the proposal to the conveners of all the counties connected with Glasgow and Inverness



districts. The result was that there was no objection to the proposal from those counties and towns which replied, except the Town Council of Inverness, who, by a majority, disapproved of the proposed rotation. The only counties which did not reply were Cromarty and Sutherland. In these circumstances the Board felt justified in preparing a list of classes of stock suitable for the Glasgow district, and authorised the Secretary to submit it to a meeting of members which was held at Glasgow on the 15th of December. The meeting approved of the list, subject to a few additions and alterations, which have since been considered by the Directors. That list I have now to submit to the meeting, and to move the following resolution:—"The Society approves of the proposal to hold the General Show at Glasgow in 1882, at Inverness in 1883, and at Edinburgh in 1884, and authorises the Directors to make the necessary arrangements for these meetings."

The resolution was agreed to.

IMPLEMENT DEPARTMENT.—Mr MYLNE, Niddrie Mains, gave in the Report from the Implement Committee, which recommended—

1. That no premiums, awards, or public distinction of any kind for implements or machines be given without thorough and exhaustive open and competitive trials.
2. That premiums be confined to entirely new inventions; or to real improvements upon existing implements and machines destined to remedy marked defects.
3. That no prizes or awards be given in connection with general shows except such as have been publicly announced in the official list of the premiums to be competed for.
4. That any real improvements or new inventions be intimated to the Secretary before 1st March, and submitted to the Implement Committee for report as to whether they are considered worthy of entry and trial.
5. That the Society provide ground at a suitable season and make arrangements for the proper trial of implements and machines to be classed under certain heads, and a charge made for the entry of each.
6. That the following implements being yet in a comparatively undeveloped state, should be dealt with as new inventions, and premiums should be offered as follow:—

*For Competition at Stirling in 1881.*

Potato lifters, 3 premiums of £15, £10, £5	...	...	...	...	...	...	...	...	£30
Turnip lifters, 3 premiums of £15, £10, £5	...	...	...	...	...	...	...	...	30
Artificial manure distributors, 3 premiums of, £15, £10, £5,	...	...	...	...	...	...	...	...	30
									£90

*For Competition at Glasgow in 1882*

Combined reaper and binder, or lifting and binding machine, 3 premiums of £100, £50, £25	...	...	...	...	...	...	...	...	£175
Seed cleaners, 3 premiums of £15, £10, £5	...	...	...	...	...	...	...	...	30
									£205

*For Competition at Inverness in 1883.*

Turnip thinners, 3 premiums of £15, £10, £5	...	...	...	...	...	...	...	...	£30
Potato planters, 3 premiums of £15, £10, £5	...	...	...	...	...	...	...	...	30
Weed eradicators, 3 premiums of £15, £10, £5	...	...	...	...	...	...	...	...	30
									£90

7. That the Society at the time of the annual trials provide ground suitable for the exhibition of other implements and machines as follows:—First year, 1881—ploughs, grubbers, diggers, and cultivators. Second year, 1882—mowers, horse rakes, and hay collectors. Third year, 1883—ploughs, grubbers, diggers, and cultivators. Notice to be sent in not later than 1st March, and entry money to be charged.

8. That notwithstanding these regulations, it shall be in the power of the Implement Committee at any time to recommend to the Directors for trial, and award any extraordinary invention or improvement.

9. That the Committee have power to withhold prizes where there is not sufficient merit, or apportion them as they think best.

The Report was adopted.

EXPERIMENTAL STATIONS.—Dr AITKEN submitted his report, in which he said—We have now secured the third crop of one rotation—viz, Italian ryegrass. Owing to the long drought during the summer, the hay crop in the Lothians was a short one, but the crop at Pumpherston was a very fair one considering the season. It was got in in good condition, and is now undergoing analysis. A dry season is known to be very unfavourable to the action of light manures, and had these been applied to the various

plots in the ordinary way, the result would not have been very satisfactory. As it happened, the Chemical Committee determined not to apply any manures to the grass crop last year, but considered it preferable to note the effects of the former manurings upon the bulk and character of the hay crop. Owing to this circumstance, the value of the hay experiments was very little affected by the drought. On the small plots the crop was turnips, for which the various manures under experiment were applied. Another series of small plots similar to those at the Society's stations were put under turnips at Liberton, and all were secured and sampled in good condition. On the home farm of the Marquis of Tweeddale at Yester an excellent series of experiments, similar to six of the more important plots at our own stations, was carried out on two different kinds of soil. They were under the direction of Mr Swinton, and have produced results of a very well-marked and interesting character. Another series of experiments with turnips grown upon various soils in Forfarshire, under the direction of Mr Lawson, Sandyford, and very similar in their character to some of the Society's experiments, were approved by the Chemical Committee, and samples of them all were received for analysis. There have thus been seven different stations at which experiments with turnips have been carried out in connection with the investigations undertaken by the Society, and samples of these, amounting to about 8000 turnips, are at present being analysed in the laboratory. The results already obtained differ widely in several important particulars, and show the need for greatly increasing the number of similar experiments throughout the country. I hope the time is near when we shall have our experiments repeated in every county of Scotland, and when the special work carried on at the Society's own stations shall be of a kind less affected by soil, situation, and climate, and more intimately concerned in the solution of scientific questions arising out of the practice of agriculture.

CHEMICAL DEPARTMENT.—Mr MACKENZIE of Portmore read the

REPORT BY SPECIAL COMMITTEE appointed to consider and report on Mr SCOTT DUDGEON'S proposed Resolutions as to Chemical Analyses; and on the proposal by the Directors to give the Chemist an allowance for Assistants and Laboratory Expenses; and moved its adoption. The Report is as follows:—

*Resolution by, and Proceedings at, General Meeting.*

At the General Meeting held at Kelso, on the 28th July 1880, the following resolution was adopted:—"The Society being satisfied that the benefits which chemical analyses are calculated to confer on agriculture can be more widely diffused and more economically accomplished through the agency of local analytical associations than by the carrying out of the resolution adopted at the General Meeting at Perth, resolves to rescind such resolution; and remits the whole subject matter embraced in the remainder of Mr Scott Dudgeon's proposed resolutions to the Directors, with the recommendation that they appoint a committee, composed one-half of their own body and one-half of members who are not in the Directorate, to consider and report to a subsequent General Meeting of the Society." It was afterwards agreed that Mr Scott Dudgeon should have the nomination of members not on the Directorate, and that the committee should name their own chairman. It was also remitted to the same committee to consider and report on a proposal by the Directors to give the chemist an allowance for assistants and laboratory expenses.

*Mr SCOTT DUDGEON'S Proposed Resolutions.*

Mr Dudgeon's proposed resolutions were in the following terms:—

I. The Society being satisfied that the benefits which chemical analyses are calculated to confer on agriculture, can be more widely diffused and more economically accomplished through the agency of local analytical associations than by the carrying out of the resolution adopted at the General Meeting at Perth, resolves to rescind such resolution; and, further, with the view of encouraging as well as regulating the conduct of these associations, resolves to contribute from its funds towards their expenses.

II. That the amount of such contribution shall be to each association at the rate of 5s. for each full analysis, and of 2s. 6d. for each partial analysis of manure or feeding-stuff effected, provided the association shall satisfy the Chemical Committee of the Society on the following points:—

1. That the analyst employed is of acknowledged standing.
2. That the association is managed by a committee of practical farmers occupying land in the district.
3. That analyses are only made for farmers, and that these subscribe towards the expenses of the association.
4. That each analysis represents at least 2 tons of bulk actually purchased by guarantee by one or more members, and that the analysis has been made from a fairly drawn sample, of which a duplicate has been retained.

5. That with each analysis is furnished names and addresses of the seller and the buyer or buyers, the guarantee given, the price at which bought, and the result as determined by the association's analyst.
6. That sellers be bound to supply up to 20 tons of any manufactured manure reported upon at the same price to any member of the association, if called upon within fourteen days after the analysis has been reported to the association.
7. That all analyses be reported on a uniform basis, to be furnished by the Society, and valuations of manures, if any are made, to be calculated on a uniform standard to be issued each year by the Society.

III. That full details of all analyses made, for which contribution has been paid, shall be published each year in the Transactions; but before such is done in the case of any which shall show an inferiority in valuable constituents of more than (5 or 10 per cent. ?) between the guarantee given and the analysis obtained, there may be (at the option of the seller, to whom due notice shall be given) an appeal to an independent chemist to be chosen by the Society.

#### *Appointment of, and Remit to, Committee.*

In accordance with the resolution by the General Meeting at Kelso, the following members were nominated at a Special Meeting of Directors held on 1st September, to consider and report on the subject matter embraced in Mr Scott Dudgeon's proposed resolutions, and on the proposal by the Directors to give the chemist an allowance for assistants and laboratory expenses.

**MEMBERS SELECTED BY DIRECTORS** :—Lord Napier and Ettrick, K.T.; Mr Mackenzie of Portmore; Mr Mylne, Niddrie Mains; Mr Smith, Whittinghame; Mr Smith, Stevenson Mains.

**MEMBERS NOMINATED BY MR SCOTT DUDGEON** :—Mr Scott Dudgeon, Longnewton; Rev. John Gillespie, Mouswald; Mr W. P. Hope, Leith; Mr Nicoll, Littleton; Mr Ross, Newtonlees.

#### *Recommendations by Committee.*

In terms of the above remit, your Committee met on the 13th October (when Lord Napier and Ettrick, K.T., was appointed chairman), on the 10th November, and on the 8th and 15th December, and having considered the subjects remitted to them, and heard the opinions of the several members, beg to report as follows :—

#### *I. Chemical Analyses.*

I. With the view of encouraging, as well as regulating the conduct of, analytical associations, the Committee recommend that the Society should contribute from its funds towards their expenses a sum for the present not exceeding £250 annually.

II. That the amount of such contribution shall be to each association at the rate of 5s. for each full analysis, and 2s. 6d. for each partial analysis of manures or feeding-stuffs effected, or such proportion thereof as the above annual contribution may permit of, the pecuniary assistance thus contemplated to be subject to the following conditions being complied with to the satisfaction of the Chemical Committee :—

1. That the rules of the association be submitted to and approved of by the Chemical Committee.
2. That it be a condition of participating in the grant that the association make analyses for members of the Highland and Agricultural Society being farmers and not members of the local association, charging them the cost price to the association, less the amount recovered from the Society.
3. That the association is managed by a committee of practical farmers owning or occupying land in the district.
4. That the analyst employed is of acknowledged standing.
5. That the benefits of the grant shall apply only to analyses made for farmers, and that they subscribe towards the expenses of the association, subject to the exception in No. 2.
6. That each analysis represents at least 2 tons of bulk actually purchased under guarantee, or at a specified price per unit of valuable ingredients, and delivered to one or more members, and that the analysis has been made from a sample drawn in accordance with the published instructions of the Society, and that a sealed duplicate sample has been retained.
7. That with each analysis is furnished the names and addresses of the seller and of the buyer or buyers, the guarantee given, the cash or credit price at which bought, the place of delivery, and the result as determined by the analyst of the association.
8. That in the case of any manufactured manure reported upon, the seller shall be obliged to supply members of the association with a further quantity at the same price and terms, provided the order is given not later than one month

after the parcel reported upon has been delivered, and the quantity in all does not exceed 20 tons.

9. That all analyses be reported according to forms to be furnished by the Highland and Agricultural Society, and valuations of manures, if any are made, to be calculated on a uniform standard to be issued periodically by the Society, and at least once a year.

III. That a summary of all analyses for which the Society has contributed payment, and full details of such as shall appear to the Chemical Committee worthy of notice, shall be published each year in the Transactions. But before such publication is made, in the case of all which show an inferiority in the whole valuable constituents of 8 per cent. or upwards between the guarantee given and the analysis obtained, there may be at the option of the seller, to whom due notice will be given, a further analysis made by an independent chemist to be chosen by the Society.

## II. *Laboratory Expenses and Duties of Chemist.*

- I. That the allowance to Dr Aitken, chemist to the Society, should be :—

1. Salary as at present . . . . .	£300
2. For assistants and service in the laboratory . . . . .	140
3. For rent, apparatus, chemical reagents, gas, coke, coal, &c. . . . .	160
	£600

- II. That the duties of the chemist should be :—

1. To prepare annually for publication in the Society's Transactions a report on the more important investigations and experiments being conducted in this country and elsewhere on the application of chemistry to agriculture.
2. To superintend the experiments being carried on at the experimental stations of the Society, to make all necessary analyses and investigations in connection therewith, and to prepare an annual report of these for publication in the Transactions.
3. To perform the requisite analyses in connection with such other experiments as are conducted under the sanction and direction of the Chemical Committee, and report on the same if desired.
4. To prepare a summary of all analyses for which the Society has contributed payment, and full details of such as shall appear to the Chemical Committee worthy of notice for publication in the Transactions.
5. To attend all meetings of the Chemical Committee of the Society.
6. To have a laboratory in Edinburgh, where he may be consulted by members of the Society, and to be in attendance there every Wednesday for that purpose.
7. To maintain a sufficient staff of assistants, one of whom at least shall be specially engaged in, and acquainted with, both the chemical and experimental work of the Society.
8. To deliver lectures at such places and on such subjects connected with the chemistry of agriculture, as shall be approved of by the Chemical Committee, and for which the Chemist shall be permitted to receive remuneration from the parties applying for his services.

The chemist and his assistants shall be paid their travelling expenses when on the Society's work.

He shall receive a fee of £1, 1s. for each analysis made by him, when employed as referee in connection with local associations.

He shall be entitled to charge for analyses made for members of the Society according to the scale of fees annually published in the Transactions.

NAPIER AND ETRICK, *Chairman of Committee.*

EDINBURGH, 15th December 1880.

Mr LINDSAY, Meadowflat, seconded the motion. He said he was sorry that he could not congratulate the Directors on having given their adhesion to the proposals, as he understood that they were coerced into them. It seemed to him that if the resolutions were adopted it would institute a new era in agriculture.

Mr MACKENZIE said that the differences between the Directors and Mr Scott Dudgeon on the subject were merely as to matters of detail.

Mr LINDSAY said he disapproved of the terms of the appointment of the chemist. He thought they should give a man a good salary, and have the whole of his time devoted to their work.

Mr MELVIN said he thought that steps should be taken to get reports in regard to Continental experimental stations.

Mr MACKENZIE said that Dr Aitken was in communication with most of the stations.

Mr SCOTT DUDGEON said that it was part of the instructions to the chemist to obtain such information.

Mr LINDSAY said he wished to enter his dissent against the terms of the appointment of the chemist.

Mr SCOTT DUDGEON said he would be glad to see the proposals passed by the Society, and he wished to inform outsiders that the labours of the committee had been conducted most pleasantly. They found every readiness on the part of the Directors to make the scheme as good as possible. As to the salary of the chemist and his duties, he could say that the proposal was an excellent one, and that they were not giving the chemist a halfpenny more than he deserved. He would like to see their chemist independent of other work than their own; but that could not be the case at present, as it would cost a thousand a year at the very least.

Mr LINDSAY said he did not insinuate anything against Dr Aitken personally, but he spoke on general grounds.

The report was then agreed to.

**TECHNICAL SCHOOLS OF AGRICULTURE.**—Colonel INNES of Learney moved—“(1.) That there is urgent need for the establishment of central technical schools of agriculture in the several agricultural districts of Scotland; and (2.) that it is the duty of the Highland and Agricultural Society to promote the establishment and maintenance of such schools.” In supporting the motion, Colonel Innes said he could not help entertaining the belief that he might safely leave the resolution without attempting any advocacy of it, and thought it must commend itself generally to the assent of this Society and of those present; but his object was not only to obtain a general assent, but such an assent as would carry along with it a practical application if they should resolve that the institution of such schools was not only a good thing in the district, but one to which they should set themselves about earnestly. He might say that he did not pretend himself to be in the position of enforcing this view, except that he had a connection with an association established to promote a school in the north of Scotland which had led him to take up the subject. Six years ago, having the honour of being on the Board of Directors, he proposed that the Society should memorialise the Committee of the Privy Council on Education on the propriety of establishing agriculture as a branch of the system of physical science taught under the superintendence of the Department of Science and Art in the schools department. That memorial was eventually successful, but he could assure the meeting that that success was not attained without exertions and without difficulty. They found on applying to the department that it was generally assumed that the mass of agriculturists as a class were not, as it were, susceptible of this technical training given in other branches of industry; but he was happy to say that that view did not prevail. All honour to the nobleman whom they had that day placed in the position of President of their Society—the Duke of Richmond and Gordon, who was President of the Council and the Sub-Department of Education. Thanks to the enlightened and active interest that he took in the subject himself, a resolution was adopted including this amongst the technical subjects of education encouraged by the Privy Council. In the report of the past year he found that of agricultural students for whom grants were drawn from the Education Department, in England and Wales there were 1449, and in Scotland 343. As agriculturists he thought they must view that as sufficiently encouraging, because a system of that sort could not spring up in a day. It must grow up like other agricultural crops. Of the 343 agricultural students in Scotland to whom he had referred, they found that 306 were from the north of Scotland; from the south-east there were none; from the south-west, 37. This large proportion, almost exclusive distribution of students in the north of Scotland, had been due to the Central Technical School of Agriculture, which, by the active assistance of a well-qualified teacher in chemistry, Mr Jamieson, who took up the matter warmly, was established in Aberdeen. It had now been continued from year to year for four years, and he held in his hands the annual reports presented to the association. In 1876, the first year, there were 42 agricultural students; in 1877, 56; and in 1878, 63. The report for the past year was not yet completed, but he had grounds for saying that there was a decrease in the elementary classes, whereas there was a great increase in the more advanced instruction. Besides the instruction given by Mr Jamieson, who was an analytical chemist well known in connection with the experiments in the north of Scotland, and who, he believed, was engaged in similar experiments in the southern counties of England, they last year, with great difficulty from their small funds, were enabled to institute additional subjects of instruction. The subjects included veterinary surgery, breeds and breeding, dairy farming, surveying, drainage, &c. Two years ago the managers of the school applied to the Highland and Agricultural Society for assistance. They received a sum of £25, for which they were grateful, and he thought that if they placed it against the results it might besaid that the money was well expended. The great difficulty which they experienced in obtaining the attendance of young farmers for six weeks at such a school was that they had to sacrifice time and incur expense,

and they had recently conceived the idea that their school might be brought within the category of those which were encouraged by the Education Department, to the extent of giving scholarships to encourage attendance. One condition of those scholarships of £25 each was that from other sources a similar sum should be raised. An application had been made to the Directors to the effect that the Education Department offered scholarships of £25 each provided an equal sum was raised; and he thought it was not too much to ask the Highland Society to contribute towards two such scholarships. In due course he received a reply informing him that the Board regretted that it was impossible for them to recommend a grant to be made to the Agricultural School in Aberdeen, as there were no funds. Now, he did not wish to appear as putting himself in as aspect of hostility, or complaint even, regarding the resolution of the Directors. He felt that unless he could place himself in this position—that they had not only the theoretical but the practical assent of the general body of the Society—he could not carry with him the agricultural opinion, as it were, in favour of the principles which he had stated in the resolution now before the meeting. He could not expect that the Directors should divert funds which had been applied by resolution towards other objects. The Board of Directors, he was confident, was always a reflex of the agricultural opinion of the Society, and it was only by obtaining an assent to his proposal, not only theoretically and abstractly, but because it was a thing that was worthy of attention, and could be energetically set about, that he could expect any support from the Directors.

After some further arguments in favour of the establishment of such schools, Colonel Innes concluded by venturing to anticipate that if the Society would agree to affirm the proposals he had made, it would not be without its influence in attaining the object he aimed at.

Mr FERGUSON of Kinnmundy said that but for the lateness of the hour and the smallness of the meeting he would have entered into the question. He must say, however, that the two principles contained in the motion must commend themselves to all who had given their attention to agriculture. He seconded the motion.

It was suggested that the proposal might be left for the consideration of the Directors.

Mr MELVIN said he thought there could be no objection to the first part of the motion; but, as to the second, and with such a small meeting, he thought it would be very injudicious to pronounce any opinion upon it.

Colonel INNES said he was quite willing to take out of the second branch of the resolution anything that would involve the necessity for the Directors considering the question of contribution unless they saw the propriety of it.

Mr FERGUSON said he understood that they were not committing the Directors to any direct contribution or responsibility whatever, but only asking them to look at the present state of things, and do what they could to promote the scheme.

Colonel INNES said that to carry the consent of the meeting he would withdraw the word "maintenance."

Mr FORBES IRVINE appealed to Colonel Innes whether, when so few members (only 13) were present, he would press the Society to give an opinion on the second part of the question.

Colonel INNES felt that when a motion of this kind was printed and circulated throughout the country, it was the duty of those who brought it forward, unless some very sufficient reason presented itself, to persevere with it. He was sorry that the general body of those who were present had not thought it of sufficient interest to wait until the matter was discussed; but he presumed that if they had any very active hostility or objection to the motion they would have remained to oppose it.

The motion was unanimously adopted in the following form:—“(1) That there is urgent need for the establishment of central technical schools of agriculture in the several agricultural districts of Scotland; and (2) that it is the duty of the Highland and Agricultural Society to encourage the establishment of such schools.”

**AGRICULTURAL BURSARIES.**—Mr MENZIES, in the absence of Professor Wilson, reported that the examination of candidates for the Society's bursaries took place on the 20th of October, when Daniel Bain, Pulteneytown, Wick; James Craig, Urquhart, Dunfermline; William Henderson, East Elrington, Haydon Bridge; E. H. Smith, Whittinghame, Prestonkirk; Marcus Sandison, Hemprigg, Wick; R. P. Wright, Downan, Ballantrae—passed for bursaries of £20 each; and Andrew Brown, Nether Auchreddie, New Deer; and Donald Finlayson, Pulteneytown, Wick—for bursaries of £10 each.

**DISTRICT COMPETITIONS.**—Mr MENZIES, in the absence of Mr Campbell Swinton of Kimmerghame, also reported the premiums awarded in 1880 and those offered in 1881.

**COTTAGE COMPETITIONS.**—Mr MENZIES, in the absence of Mr Maxwell Inglis of Loganbank, reported the premiums awarded in 1880 and those offered in 1881.

**PREMIUMS FOR REPORTS AWARDED IN 1880 AND OFFERED IN 1881.**—**TRANSACTIONS FOR 1881.**—Mr IRVINE of Drum reported the premiums awarded for reports in 1880, those offered for competition in 1881, and the contents of the forthcoming volume of the “Transactions.”

**FOOT AND MOUTH DISEASE.**—Mr MENZIES read the following memorial to the Privy Council and reply :—

"To the Lords of her Majesty's Most Honourable Privy Council, the memorial of the Highland and Agricultural Society of Scotland, incorporated by Royal Charter.

"Humbly sheweth,—That your memorialists learn with deep concern that foot-and-mouth disease is prevalent in twenty-four counties in England. That Scotland has been free from this scourge for a considerable time. That your memorialists would humbly beg to impress on her Majesty's Most Honourable Privy Council the necessity of immediate action being taken to prevent the spread of this disease into Scotland, by calling on the local authorities to take such steps at once, under the Contagious Diseases (Animals) Act, as may be deemed proper, and, if necessary, to stop the transit of cattle and sheep from England into Scotland.—(Signed) by order of the Directors,

"ADAM SMITH, Chairman.

"Edinburgh, 5th January 1881."

"Veterinary Department, Privy Council Office, 44 Parliament Street, Westminster, S.W., 10th January 1881.

"Sir,—I have submitted to the Lords of the Council the memorial addressed to their Lordships by the Highland and Agricultural Society of Scotland, transmitted with your letter of the 6th inst., referring to the danger of allowing disease to be taken into Scotland by animals from England; and I am directed, in reply, to forward copies of the various Orders of Council issued by their Lordships with reference to foot-and-mouth disease, and to add that, if they fail to arrest the spreading of the disease in question, their Lordships will be prepared to take such further steps as may be deemed expedient for the protection of Scotland.—I am, sir, your obedient servant,

(Signed) "C. L. PEEL.

"The Secretary, Highland and Agricultural Society of Scotland."

On the motion of Mr IRVINE of Drum, a vote of thanks was accorded to Lord Napier and Ettrick for presiding, and the proceedings terminated.

#### REPORT OF THE SOCIETY'S VETERINARY EXAMINATION, FIFTY-SEVENTH SESSION, 1879-80.

The examination for this session took place on Monday, Tuesday, and Wednesday, the 5th, 6th, and 7th April. The examination on Monday, which was held in Mr Buist's Auction Mart, Lauriston, kindly lent for the occasion, was upon the practical branches of the course; and those on the two subsequent days upon the theoretical subjects. The distribution of certificates and medals to the successful candidates took place on the 7th in the Society's Hall, George IV. Bridge. Major Wauchope of Niddrie Marischall, chairman of the Society's Veterinary Committee, presided. Among the other gentlemen present were—Drs Douglas MacLagan, Craig, and Dycer, Edinburgh; Messrs Finlay Dun and Thomas Dollar, London; Mr Thomas Taylor, Manchester; and Professors Walley and M'Fadyean, Edinburgh.

The CHAIRMAN congratulated the successful students on their having obtained the certificate of the Society, and wished them every success in life. He then distributed the certificates and medals to the following successful candidates.—Messrs Christopher Black, Meath; William Calvert, Middleham; Joseph Donald, Cumberland; James J. Fraser, Keith; James Wood Ingram, Manchester; Frank Mavor, London; Archibald Munro, Holytown; William Ryan, Limerick; George Whitehead, Barnsley; Joseph Woods, Kirkham, Lancashire; James Chalmers, Annan; and Edward J. A. C. Yorston, Manchester. The medal for the best practical examination was awarded to Mr Yorston, with 39 marks out of a possible 40. In the best general examination two candidates were equal, each having obtained 44 marks—viz., William Calvert, Middleham, and Jas. Wood Ingram, Manchester; and the Chairman intimated that the Society would grant a medal to each.

Drs DYCKER and CRAIG each briefly addressed the students. The latter referred to the high standard of efficiency, as manifested by the examination, which the students had attained to, very few having failed in both departments.

The following gentlemen acted as examiners :—*Botany*—Professor Balfour; Dr Cleghorn of Stravithie, St Andrews. *Chemistry*—Dr W. Craig; A. Inglis M'Callum. *Anatomy*—Dr Dycer; C. Cunningham, Slaford; A. Spreull, Dundee. *Physiology and Histology*—Dr Dycer; C. Cunningham, Slaford; Andrew Spreull, Dundee. *Materia Medica*—Professor Balfour; Professor Douglas MacLagan; Finlay Dun; Dr Craig; A. I. M'Callum. *Diseases of Horses*—John Borthwick, Kirkliston; John Lawson, Manchester; Tom Taylor, Manchester. *Diseases of Cattle, Sheep, Swine, and Dogs*—Thomas A. Dollar, London; Alexander Pottie, Paisley; R. Rutherford, Edinburgh.

A vote of thanks to the Chairman terminated the proceedings.

## PREMIUMS AWARDED BY THE SOCIETY IN 1880-81.

## I.—REPORTS, 1881.

## AGRICULTURAL.

1. James Macdonald, Editor, Irish Farmers Gazette, Dublin, for a Report on the Agriculture of the Counties of Forfar and Kincardine, . . . . .	£30	0	0
2. Archibald McNeillage, Jun., 194 St Vincent Street, Glasgow, for a Report on the Agriculture of Bute and Arran, . . . . .	20	0	0
3. Thomas Lawson, Sandyford, Kirriemuir, for a Report of Experiments on the Culture of Turnips, . . . . .	20	0	0
4. George Bruce, Pennan Farm, Fraserburgh, for a Report on the First Principle in Agriculture, . . . . .	10	0	0
5. David Archibald, Duddingstone, South Queensferry, for a Report on the Leicester Breed of Sheep, . . . . .	10	0	0
6. John W. J. Paterson, Terrona, Langholm, for a Report on the Breeding and Rearing of Horses, . . . . .	10	0	0
7. R. Rutherford, V.S., 10 Bread Street, Edinburgh, for a Report on Innoculation as a Prevention to Pleuro-Pneumonia, . . . . .	10	0	0
8. David W. Wemyss, Newton Bank, St Andrews, for a Report on the Results of Feeding on the Quantity and Quality of Butter and Cheese, . . . . .	10	0	0
9. Duncan Clerk, Writer, Oban, for a Report on Grazing Cattle and Sheep Together or Separately, . . . . .	10	0	0
10. James Graham, Bank of Scotland, Edinburgh, for Model of Cattle Truck for Feeding and Watering Animals in Transit, . . . . .	10	0	0
11. H. Kidd, 63 Wide Bargate, Boston, Lincolnshire, for a Report on Sheep Fox, . . . . .	7	0	0
12. Primrose McConnell, Castlemains, New Cumnock for a Report on Insects which prey upon Agricultural Plants, . . . . .	5	0	0
13. William Anderson Smith, Ledaig, Argyllshire, for a Report on Oyster Culture in Scotland, . . . . .	5	0	0
14. William Sloan Hamilton, Springside, Kilmarnock, for a Report on Threshing Grain, . . . . .	3	15	0
15. R. Smith, Auchmar, Leslie, Aberdeenshire, for Constructing a Wheel for Raising Water, . . . . .	10	6	

## FORESTRY.

16. Robert Hutchison of Carlowrie, Kirkliston, for a Report on Old and Remarkable Beeches, . . . . .	10	0	0
17. Robert Hutchison of Carlowrie, Kirkliston, for a Report on Old and Remarkable Oaks, . . . . .	10	0	0
18. Robert Hutchison of Carlowrie, Kirkliston, for a Report on the <i>Pinus insignis</i> , . . . . .	5	0	0
19. Robert Hutchison of Carlowrie, Kirkliston, for a Report on the Effects of the severe Frost of December 1879 on Trees and Shrubs, . . . . .	5	0	0
20. Robert Hutchison of Carlowrie, Kirkliston, for a Report on the Destruction to Woods and Trees by the Gale of 28th December 1879, . . . . .	3	15	0

## IMPLEMENTS.

21. William Wallace, 7 Graham Square, Glasgow, for a Report on Arranging the Implement Department at General Shows, . . . . .	15	0	0
22. Joseph Parsloe, Brereton, Bedford, for a Report on Arranging the Implement Department at General Shows, . . . . .	10	0	0
23. Alexander Leslie, Cherryvale, Aberdeen, for a Report on Arranging the Implement Department at General Shows, . . . . .	5	0	0

£225 0 6

## II.—KELSO SHOW, 1880.

## CLASS I.—CATTLE.

## SHORTHORN.

## SECTION I. BULLS calved before 1st January 1878.

1. John Vickers, Mown Meadows, Crook, Durham, "Duke of Howl John" (32,674) . . . . .	£25	0	0
2. The Earl of Ellesmere, Worsley Hall, "Attractive Lord" (32,668) . . . . .	15	0	0

Carry forward, £40 0 0



	Brought forward,	£40 0 0
3. Thomas Willis, jun., Manor House, Carperby, Bedale, "Vice-Admiral" (88,257)		10 0 0
Breeder of Best Bull—Messrs Vickers, Howl John, Stanhope,	Silver Medal,	• 0 10 0

## SECTION 2. BULLS calved after 1st January 1878.

1. The Duke of Richmond and Gordon, K.G., Gordon Castle, "Arthur Benedict" (40,986),	25 0 0.
2. James Nicholson, Murton, Berwick-upon-Tweed, "Harold" (41,671)	15 0 0.
3. Robert Taylor, Crosby Lodge, Shap, Westmoreland, "Prince Louis" (42,189),	10 0 0.
V. H. C., James A. Gordon, Udale, Invergordon, "Rosario 2d" (42,299). H. C., Sir Thomas Buchan Hepburn, Bart., "Smeaton Hero" (42,419). C., Alex. F. Nares, Brucktor, Old Meldrum, "Edgar" (41,501).	

## SECTION 3. BULLS calved after 1st January 1879.

1. Clement Stephenson, Sandyford Villa, Newcastle-on-Tyne, "Paganini,"	15 0 0.
2. The Duke of Northumberland, Alnwick Castle, "Royal Commissioner,"	10 0 0.
3. James Nicholson, Murton, Berwick-on-Tweed, "Mischief Maker,"	5 0 0.
H. C., The Duke of Northumberland, "Lord Bennett." C., Walter Scott, Glendronach, Huntly, "Good Hope."	

## SECTION 4. COWS of any age.

1. Thomas Lambert, Elrington Hall, Haydon Bridge, "Princess Louise,"	20 0 0.
2. John Law, New Keig, Whitehouse, Aberdeen, "Velinda,"	10 0 0.
3. The Duke of Northumberland, "Lady Jane,"	5 0 0.
V. H. C., Benjamin St John Ackers, Prinknash Park, "Lady Carew 3d." H. C., James Whyte, Albrow Hall, Darlington, "Bainesse Rose." C., James Whyte, Albrow Hall, Darlington, "Stanwick Rose."	

## SECTION 5. HEIFERS, calved after 1st January 1878.

1. The Duke of Northumberland, "Rose of Allandale,"	15 0 0.
2. James Whyte, Albrow Hall, Darlington, "Gaiety 6th,"	10 0 0.
3. Evan Baillie of Dochfour, Inverness, "Sweet Pea,"	5 0 0.
V. H. C., Clement Stephenson, Sandyford Villa, Newcastle, "Alice Smeaton."	

## SECTION 6. HEIFERS calved after 1st January 1879.

1. Benjamin St John Ackers, Prinknash Park, "Lady Carew 4th,"	10 0 0.
2. James Watt, Garbity, Fochabers, "Emily Hope,"	8 0 0.
3. John Belp, Maulds Meaburn Hall, Shap, "Bright Duchess,"	4 0 0.
V. H. C., The Duke of Richmond and Gordon, K.G., Gordon Castle, "Lady Violet." H. C., Alexander F. Nares, Brucktor, Old Meldrum, "Viscountess." C., Lord Polwarth, Mertoun House, St Boswells, "Emerald."	

## SECTION 7. COWS of any age, and two of their Descendants, Male or Female.

1. William Langholm, East Mill Hills, Haydon Bridge, "Diadem 1st,"	20 0 0.
2. Lord Polwarth, Mertoun House, St Boswells, "Wave Foam,"	10 0 0.
3. Lord Polwarth, Mertoun House, St Boswells, "Maggie Gwynne,"	5 0 0.

## POLLED ANGUS OR ABERDEEN.

## SECTION 8. BULLS calved after 1st January 1878.

1. Robert Anderson, Daugh, Tairland, "Prince Albert of Baads" (1836),	20 0 0.
2. William James Tayler, Rothiemay House, Huntly, "Sir Maurice" (1819),	10 0 0.
3. T. L. M. Cartwright, Melville, Ladybank, "Black Prince" (1244),	5 0 0.
Breeder of Best Bull—George Reid, Baads, Peterculter, Aberdeen, Silver Medal,	0 16 0

## SECTION 9. BULLS calved after 1st January 1878.

1. Thomas Ferguson, Kinnochtry, Coupar-Angus, "Prince of Realm,"	20 0 0.
2. Sir George Macpherson Grant of Ballindalloch, Bart., M.P., "Justice" (1462),	10 0 0.
3. George Reid, Baads, Aberdeen, "Young Juryman" (1591),	5 0 0.
H. C., The Earl of Strathmore, Glamis Castle, Forfar, "Bombastes" (1548).	

Carry forward, £328 12 0.

Brought forward, £232 12

## SECTION 10. BULLS calved before 1st January 1879.

1. Henry D. Adamson, Balgutharn, Alford, Aberdeen, "Knight of the Shire,"	10	0	0
2. Lieut.-Col. Ferguson of Pitfour, Mintlaw, "Marischal Keith,"	5	0	0
3. The Earl of Strathmore, Glamis Castle, Forfar, "Ensign,"	3	0	0

## SECTION 11. COWS of any age.

1. Hendry D. Adamson, Balgutharn, Alford, Aberdeen, "Sybil 2d" (3526),	20	0	0
2. Lieut.-Col. Ferguson of Pitfour, Mintlaw, "Dulcet" (4057),	10	0	0
3. Sir George Macpherson Grant, Bart., M.P., "Maid of Aven" (2995),	5	0	0
V. H. C., W. M. Skinner, Drumin, Glenlivet, "Sunshine 2d" (3332). H. C., Thomas Smith, Powrie, Dundee, "May 3d" (3732).			

## SECTION 12. HEIFERS calved after 1st January 1878.

1. The Earl of Airlie, K.T., Cortachy Castle, Kirriemuir, "Pavilion" (3772),	10	0	0
2. Henry D. Adamson, Balgutharn, Alford, Aberdeen, "Pride of Aberdeen 18th,"	6	0	0
3. Sir George Macpherson Grant, Bart., M.P., "Sprite" (3796),	4	0	0
H. C., The Earl of Strathmore, Glamis Castle, Forfar, "Queen Mary 1st of Glamis" (3312). C., W. M. Skinner, Drumin, Glenlivet, "Gaiety 3d" (3983).			

## SECTION 13. HEIFERS calved after 1st January 1879.

1. The Earl of Airlie, K.T., Cortachy Castle, Kirriemuir, "Miranda" (4204),	8	0	0
2. Robert Anderson, Daugh, Tarland, "Lady Album 2d,"	5	0	0
3. John Hannay, Gavenwood, Banff, "Idyll,"	3	0	0
V. H. C., Sir George Macpherson Grant, Bart., M.P., "Rose Blossom" (4173). H. C., The Earl of Strathmore, Glamis Castle, Forfar, "Viola of Glamis." C., George Reid, Baada, Aberdeen, "Isle the 3d."			

## GALLOWAY.

## SECTION 14. BULLS calved before 1st January 1878.

1. Peter Morton & Sons, Pedder Hill, Longtown, "Prince Charlie" (1549),	20	0	0
2. James Little, Fauld, Longtown, "Liddesdale" (1031),	10	0	0
3. James Cunningham, Tarbreoch, Dalbeattie, "Knowsley" (1279),	5	0	0
Breeder of Best Bull—Peter Morton & Sons, Pedder Hill, Silver Medal,	0	16	0

## SECTION 15. BULLS calved after 1st January 1878.

1. Robert Jardine of Castlemilk, M.P., Lockerbie, "Beaconsfield" (1344),	20	0	0
2. The Duke of Buccleuch and Queensberry, K.G., "Stanley" (1348),	10	0	0
3. John Millican, Wedholme House, Abbey Town, "The Mackintosh 2d" (1341),	5	0	0
H. C., The Duke of Buccleuch and Queensberry, K.G., "Buccleuch" (1342).			

## SECTION 16. BULLS calved after 1st January 1879.

1. Frederick E. Villiers, Closeburn Hall, Thornhill, "Prince Victor" (1473),	10	0	0
2. The Duke of Buccleuch and Queensberry, K.G., "Harden 2d" (1458),	5	0	0
3. The Duke of Buccleuch and Queensberry, K.G., "Macbeth" (1465),	3	0	0
V. H. C., W. & J. Shennan, Balig, Kirkcudbright, "Normandy" (1533).			

## SECTION 17. COWS of any age.

1. The Duke of Buccleuch and Queensberry, K.G., "Princess of Culmain" (2995),	20	0	0
2. The Duke of Buccleuch and Queensberry, K.G., "Lady Stanley of Drumlanrig" (2858),	10	0	0
3. The Duke of Buccleuch and Queensberry, K.G., "Hannah 3d of Drumlanrig" (2620),	5	0	0

## SECTION 18. HEIFERS calved after 1st January 1878.

1. W. & J. Shennan, Balig, Kirkcudbright, "Jenny Duke,"	10	0	0
2. The Duke of Buccleuch and Queensberry, K.G., "Bessie 2d of Drumlanrig" (3411),	6	0	0
3. The Duke of Buccleuch and Queensberry, K.G., "Nunna 2d of Drumlanrig" (3414),	4	0	
V. H. C., The Duke of Buccleuch and Queensberry, K.G., "Britomartis 2d of Drumlanrig" (3420). H.C., The Duke of Buccleuch and Queensberry, K.G., "Caroline of Drumlanrig" (3417).			

Carry forward, £556 8 0

Brought forward, £556 8 0

## SECTION 19. HEIFERS calved after 1st January 1879.

1. James Cunningham, Tarbreoch, Dalbeattie, "Mary 6th,"	8 0 0
2. James Cunningham, Tarbreoch, Dalbeattie, "Lady Stanley 6th" (3674),	5 0 0
3. The Duke of Buccleuch and Queensberry, K.G., "Nightingale 2d of Drumlanrig" (3653),	3 0 0
V. H. C., W. & J. Shennan, Balig, Kirkcudbright, "Susan of Balig 8th." H. C., W. & J. Shennan, Balig, Kirkcudbright, "Lucy of Balig 6th." C., W. & J. Shennan, Balig, Kirkcudbright, "Blackie 10th."	

## AYRSHIRE.

## SECTION 20. BULLS calved before 1st January 1878.

1. The Duke of Buccleuch and Queensberry, K.G., "Lord of the Isles,"	20 0 0
2. John Young, Cobblebrae, Falkirk, "King Carthus,"	10 0 0
3. Robert Wardrop, Garlaiff, Old Cumnock, "Wattleston Prince,"	5 0 0
Breeder of Best Bull—William Boyd, Bongang, Girvan, Silver Medal,	0 16 0
V. H. C., Duncan Keir, Buchlyvie, "Bob."	

## SECTION 21. BULLS calved after 1st January 1878.

1. The Duke of Buccleuch and Queensberry, K.G., "Scottish Chief,"	20 0 0
2. Duncan Keir, Buchlyvie, "The Baron o' Buchlyvie,"	10 0 0

## SECTION 22. BULLS calved after 1st January 1879.

1. Duncan Keir, Buchlyvie, "Auchentroig,"	10 0 0
2. John Craig, Jellyhill, Bishopbriggs, "Tom,"	5 0 0
3. John Craig, Jellyhill, Bishopbriggs, "Prince of Dalry,"	3 0 0
C., Sir Michael R. Shaw Stewart, Bart., "Lord Raglan."	

## SECTION 23. COWS in Milk, of any age.

1. W. A. MacLachlan, of Auchentroig, Balfron, "Maggie,"	20 0 0
2. Andrew McDowall, Auchtralure, Stranraer, "Kate Dalrymple,"	10 0 0
3. James Scott, Newlands, Bothwell, "Pride of Bothwell,"	5 0 0

## SECTION 24. COWS in Calf, of any age, or HEIFERS in Calf, calved before 1st January 1878.

1. The Duke of Buccleuch and Queensberry, K.G., "Lady 4th of Drumlanrig" (234),	15 0 0
2. The Duke of Buccleuch and Queensberry, K.G., "Maggie 3d" (287),	10 0 0
3. The Duke of Buccleuch and Queensberry, K.G., "Craigman,"	5 0 0
C., W. A. MacLachlan, of Auchentroig, Balfron, "Duchess."	

## SECTION 25. HEIFERS calved after 1st January 1878.

1. The Duke of Buccleuch and Queensberry, K.G., "Eva of Drumlanrig,"	10 0 0
2. The Duke of Buccleuch and Queensberry, K.G., "Fairly Queen,"	6 0 0
3. Sir Michael R. Shaw Stewart, Bart., "Hebe,"	4 0 0
V. H. C., The Duke of Buccleuch and Queensberry, K.G., "Jessie." H. C., Andrew Baird Matthews, Carségowan, Newton Stewart, "Nellie." C., The Duke of Buccleuch and Queensberry, K.G., "Bell of Drumlanrig."	

## SECTION 26. HEIFERS calved after 1st January 1879.

1. The Duke of Buccleuch and Queensberry, K.G., "Alice of Drumlanrig,"	8 0 0
2. The Duke of Buccleuch and Queensberry, K.G., "Maud 2d of Drumlanrig,"	5 0 0
3. The Duke of Buccleuch and Queensberry, K.G., "Woodbine,"	3 0 0
H. C., Duncan Keir, Buchlyvie, "Ayr the 3d." C., A. B. Matthews, Carségowan, Newton-Stewart, "Marie Antoinette."	

## HIGHLAND.

## SECTION 27. BULLS calved before 1st January 1878.

1. James Duncan, Benmore Home Farm, Greenock, "Donnachadh Ban,"	20 0 0
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Carry forward, £777 4 0

	Brought forward,	£777	4	0
2. The Earl of Seafield, K.T., Castle Grant, Grantown, "Rory,"	.	.	10	0
3. John Stewart, Duntulm, Portree, "Prince Charlie,"	.	.	5	0
Breeder of Best Bull—John Stewart, Bochastle, Callander,	Silver Medal,	0	16	0
V. H. C., The Earl of Breadalbane, Aberfeldy, "Charlie."				

## SECTION 28. BULLS calved after 1st January 1878.

1. The Earl of Breadalbane, "Fingal,"	.	.	20	0	0
2. The Earl of Seafield, K.T., Castle Grant, "Wallace,"	.	.	10	0	0
3. John Stewart, Duntulm, Portree, "Fear-a-Bhaile,"	.	.	5	0	0
V. H. C., John Stewart, Bochastle, Callander, "Lachlann Odhar."	H. C., James Duncan, Benmore Home Farm, "Lord Colln."	C., James Duncan, Benmore Home Farm, "Alistair Mohr."			

## SECTION 29. COWS of any age.

1. The Earl of Seafield, K.T., Castle Grant, "Dulnain,"	.	.	20	0	0
2. John Stewart, Duntulm, Portree, "Morchuis,"	.	.	10	0	0
3. John Stewart, Bochastle, Callander, "Mhaighdeann Bhuidhe,"	.	.	5	0	0
V. H. C., James Duncan, Benmore Home Farm, "Riabhach Mholach."	H. C., The Earl of Breadalbane, "Bell."				

## SECTION 30. HEIFERS calved after 1st January 1877.

1. John Stewart, Duntulm, Portree, "Guanach Bheag,"	.	.	10	0	0
2. The Earl of Breadalbane, "Flora,"	.	.	6	0	0
3. Hector A. Campbell, Ardfenaig, Bunessan, "Sonasac Odhar,"	.	.	4	0	0
V. H. C., The Earl of Seafield, K.T., Castle Grant, "Dava."	H. C., Hector A. Campbell, Ardfenaig, "Dubh Gharbh."	C., The Earl of Seafield, K.T., Castle Grant, "Nora."			

## SECTION 31. HEIFERS calved after 1st January 1878.

1. John Stewart, Duntulm, Portree, "Targheal Og,"	.	.	5	0	0
2. The Earl of Breadalbane, "Stalc Bhuidhe,"	.	.	5	0	0
3. James Duncan, Benmore Home Farm, "Golden Queen,"	.	.	3	0	0
V. H. C., John Stewart, Duntulm, Portree, "Guanach,"	H. C., The Earl of Breadalbane, "Mairi Riabhach."	C., James Duncan, Benmore Home Farm, "Proisag 3d."			

## FAT STOCK.

## SECTION 32. HIGHLAND OXEN calved after 1st January 1876.

1. The Earl of Seafield, K.T., Castle Grant, Grantown, "Alaster,"	.	.	6	0	0
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## SECTION 33. HIGHLAND OXEN calved after 1st January 1877.

1. The Earl of Seafield, K.T., Castle Grant, Grantown, "Geordie,"	.	.	5	0	0
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## SECTION 34. POLLED OXEN calved after 1st January 1877.

1. Robert Jardine, of Castlemilk, M.P., (Galloway), "Gladstone,"	.	.	6	0	0
2. Robert Jardine, of Castlemilk, M.P., (Galloway), "Granville,"	.	.	3	0	0

## SECTION 35. POLLED OXEN calved after 1st January 1878.

*No Entry.*

## SECTION 36. OXEN of any other Pure or Cross Breed calved after 1st January 1877.

1. John Turnbull, Sunlawshill, Kelso,	.	.	6	0	0
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## SECTION 37. OXEN of any other Pure or Cross Breed calved after 1st January 1878.

1. John Turnbull, Sunlawshill, Kelso,	.	.	5	0	0
2. The Hon. R. Baillie Hamilton, Langton, Dunse, "Bruce,"	.	.	2	0	0

## SECTION 38. CROSS-BRED HEIFERS calved after 1st January 1877.

*No Entry.*

Carry forward, £932 0 0

Brought forward, £382 0 0

## SECTION 39. CROSS-BRED HEIFERS calved after 1st January 1878.

1. The Hon. R. Baillie Hamilton, Langton, Dunse, . . . . . 5 0 0

## EXTRA CATTLE.

## Very Highly Commended.

Polled Bull, "Young Viscount" (736), Sir George Macpherson Grant, Bart., M.P.,	5 0 0
Highland Ox, The Duke of Roxburghe, . . . . .	6 2 0
Indian Cow and Calf, The Marquis of Lothian, K.T., . . . . .	5 0 0

## Highly Commended.

Jersey Cow, Sir John Marjoribanks of Lees, Bart., . . . . .	Minor Gold Medal,	3 15 0
Indian Bull, The Marquis of Lothian, K.T., . . . . .		3 0 0
Indian Bull, Sir John W. P. Campbell Orde, Bart., . . . . .		3 0 0

## Commended.

Jersey Heifer, Sir John Marjoribanks of Lees, Bart., . . . . .	Silver Medal,	0 16 0
Indian Bull, The Marquis of Lothian, K.T., . . . . .	Silver Medal,	0 16 0
Indian Cow, Sir John W. P. Campbell Orde, Bart., . . . . .	Silver Medal,	0 16 0

£965 5 0

## CLASS II.—HORSES

## FOR AGRICULTURAL PURPOSES.

## STALLION TO TRAVEL THE DISTRICT OF THE KELSO SHOW IN SEASON 1880.

Joseph Bulloch, Cockmuir, Springburn, "Zulu," . . . . . 150 0 0

## BEST STALLION for Agricultural purposes.

David Buchanan, Garscadden Mains, New Kilpatrick, "Druid" (1120), Silver Cup, £25 0 0

## BEST MARE for Agricultural purposes.

John Waddell of Inch, Bathgate, "Louisa," . . . . . Silver Cup, 25 0 0

## SECTION 1. STALLIONS foaled before 1st January 1877.

1. David Buchanan, Garscadden Mains, New Kilpatrick, "Druid" (1120), "	40 0 0
2. James M'Nab, Glenochil House, Menstrie, "Champion of the North" (1092), .	30 0 0
3. David Riddell, Blackhall, Paisley, "Roseberry" . . . . .	20 0 0
4. Lawrence Drew, Merryton, Hamilton, "Lord Harry," . . . . .	10 0 0
Breeder of Best Stallion—James Milroy, Galdenoch, Stranraer, . . . . .	Silver Medal, 0 16 0
V. H. C., Joseph Bulloch, Cockmuir, Springburn, "Zulu." H.C., Peter Crawford, Dumgoyack, Strathblane, "Lochryan." C., Robert Pollock, The Green, Mearns, "Pride of Dunlop" (1244).	

## SECTION 2. ENTIRE COLTS foaled after 1st January 1877.

1. David Riddell, Blackhall, Paisley, "Top Gallant," . . . . .	30 0 0
2. Peter Crawford, Dumgoyack, Strathblane, "The Maister," . . . . .	20 0 0
3. Robert Pollock, The Green, Mearns, "Lord Colin Campbell," . . . . .	10 0 0
4. David Riddell, Blackhall, Paisley, "Sanguhar," . . . . .	5 0 0
V. H. C., Peter Crawford, Dumgoyack, Strathblane, "Craichmore Bob." H. C., John Macdonald, Porterfield, Renfrew, "Johnnie Lad." C., John Macdonald, Porterfield, "Stanley Muir."	

## SECTION 3. ENTIRE COLTS foaled after 1st January 1878.

1. Andrew Montgomery, Boreland, Castle Douglas, "The M'Gregor," . . . . .	20 0 0
2. James Johnston, Lochburnie, Maryhill, "Lord Douglas," . . . . .	14 0 0
3. Andrew M'Dowall, Auchtralure, Stranraer, "Belted Knight," . . . . .	7 0 0
4. Alexander Lang, Garneyland, Paisley, "Pure Bone," . . . . .	4 0 0
V. H. C., David Riddell, Blackhall, Paisley, "Count Caris." H. C., John Hodge, Lochill, Mauchline, "King of the Lyons." C., Thomas Muirhead, Townhill, Dunfermline, "King Edward." . . . .	

Carry forward, £410 16 0

Brought forward, £410 18 0

## SECTION 4. ENTIRE COLTS foaled after 1st January 1879.

1. P. & J. Crawford, Brydekirk Mains, Annan, "Queensberry,"	15	0	0
2. James M <sup>c</sup> Queen of Crofts, Dalbeattie, "Robin Hood,"	8	0	0
3. James Blyth, Leckiebank, Auchtermuchty,	4	0	0
4. Lawrence Drew, Merryton, Hamilton,	2	0	0
V. H. C., James Johnston, Lochburnie, Maryhill, "Band Or." H. C., Lawrence Drew, Merryton, Hamilton. C., James M <sup>c</sup> Nab, Glenochil House, Menstrie, "Lord Galloway."			

## SECTION 5. MARES (with Foal at foot) foaled before 1st January 1877.

1. George Rodger, Arden House, Altrincham, Cheshire, "Mystery,"	30	0	0
2. The Hon. The Master of Blantyre, Sciberscross, "Queen Mary,"	20	0	0
3. Lawrence Drew, Merryton, Hamilton, "Regina,"	15	0	0
4. John Waddell of Inch, Bathgate, "Beattie Bell,"	6	0	0
V. H. C., James Blyth, Leckiebank, Auchtermuchty, "Dora."			

## SECTION 6. MARES (in Foal) foaled before 1st January 1877.

1. Robert Murdoch, West Hallside, Newton, Glasgow, "Adela,"	25	0	0
2. John Waddell of Inch, Bathgate, "Mary Gray,"	15	0	0
3. James Cunningham, Tarbreoch, Dalbeattie, "Evelyn,"	10	0	0
4. David Riddell, Blackhall, Paisley, "Madaline,"	5	0	0
H. C., The Earl of Ellesmere, Worsley Hall, "Darling."			

## SECTION 7. FILLIES foaled after 1st January 1877.

1. John Waddell of Inch, Bathgate, "Louisa,"	20	0	0
2. John M <sup>c</sup> Donald, Porterfield, Renfrew, "Porterfield Maid,"	10	0	0
3. Sir Michael R. Shaw Stewart, Bart., Ardgowan, Greenock, "Fanny,"	5	0	0
4. Lawrence Drew, Merryton, Hamilton,	3	0	0
V. H. C., Andrew M <sup>c</sup> Dowall, Auchterlure, Stranraer, "Maybelle." H. C., David Buchanan, Garscadden Mains, New Kilpatrick, "May Queen."			

## SECTION 8. FILLIES foaled after 1st January 1878.

1. Robert Murdoch, West Hallside, Newton, Glasgow, "Princess,"	15	0	0
2. John Howatson, Fulwood, Stewarton, "Young Maggie,"	8	0	0
3. The Earl of Ellesmere, Worsley Hall, Manchester, "Lassie,"	4	0	0
4. Sir Michael R. Shaw Stewart, Bart., Ardgowan, Greenock, "Annet Lyle."	2	0	0
V. H. C., Lord Arthur Cecil, Orchard Mains, Innerleithen, "Kelpie." H. C., Alexander Lang, Garneyland, Paisley, "Justice." C., The Earl of Ellesmere, Worsley Hall, Manchester, "Thistle."			

## SECTION 9. FILLIES foaled after 1st January 1879.

1. James Picken, Laigh, Langside, Craigie, Kilmarnock, "Nancy,"	10	0	0
2. William Taylor, Park Mains, Inchinnan, Paisley, "Shelia,"	5	0	0
3. Robert Murdoch, West Hallside, Newton, Glasgow, "Shelia,"	3	0	0
4. Robert Shirra Gibb, Boon, Lauder, "Daffodil,"	2	0	0
H. C., George Simson, Courthill, Kelso, "Jip."			

## SECTION 10. DRAUGHT GELDINGS foaled before 1st January 1877.

1. David Riddell, Blackhall, Paisley, "Colin,"	10	0	0
2. R. G. Graham, Burnfoot-on-Esk, Longtown, "Jock,"	5	0	0
3. Alexander Scott, 24 Mearns Street, Greenock, "Earl of Craigie,"	3	0	0

## SECTION 11. DRAUGHT GELDINGS foaled after 1st January 1877.

1. The Hon. The Master of Blantyre, Sciberscross, "The Duke,"	8	0	0
2. Robert Jardine of Castlemilk, M.P., Lockerbie, "Jolly,"	4	0	0
3. John Thompson, Baillieknowe, Kelso, "Charlie,"	2	0	0
V. H. C., The Hon. The Master of Blantyre, "The Diamond,"			

## HUNTERS AND ROADSTERS.

## SECTION 12. BROOD MARES (with Foal at foot), suitable for field.

1. Miss Margaret Humble, Cardew, Dalston, Carlisle, "Kate."	20	0	0
2. Robert Henderson, East Gordon, Gordon, "Jezebel,"	10	0	0

Carry forward, £714 18 0

3. B. P. Selby, Pawston, Cornhill-on-Tweed, "Confidence,"	Brought forward,	£714	16	0
C., John Drummond of Blackruthven, Perth, "Duchess."		5	0	0

SECTION 13. MARES or GELDINGS suitable for field, foaled before  
1st January 1878.

1. John C. Straker, Stagshaw House, Corbridge-on-Tyne, Gelding, "Gambler,"	.	.	.	.
2. William Anderson, Houghton, Carlisle, Gelding, "Paleface,"	.	.	.	.
3. James Jamieson, Edinburgh, Gelding, "Indian Warrior,"	.	.	.	.
H. C., Robert Dand, jun., Huxley Hall, Acklington, Gelding, "Deerfoot,"	C.,			
James Moffat, Crosby-on-Eden, Carlisle, Gelding, "Councillor."				

SECTION 14. MARES or GELDINGS suitable for field, foaled after  
1st January 1878.

1. Michael Wright, Charlton, Bellingham, Gelding, "The Duke,"	.	.	30	0	0
2. William Anderson, Houghton, Carlisle, Gelding, "The Mystery,"	.	.	15	0	0
3. George Dove, Crossflat, St Boswells, Gelding, "Telephone,"	.	.	10	0	0
H. C., James Robeson, Springwells, Coldstream, Gelding, "Silvertail"					

SECTION 15. MARES or GELDINGS suitable as hackneys or road-  
sters, between 14 and 15 hands high.

1. No Award.					
2. James Robeson, Springwells, Coldstream, Mare, "Jenny Nettles,"	.	.	4	0	0

SECTION 16. STALLIONS, MARES, or GELDINGS for Leaping.

1. William Munro, 5 Granville Terrace, Edinburgh, Gelding, "Greyfriar,"	20
2. Thomas Fraser Hunter, Eccles House, Coldstream, Mare, "Kate,"	10
3. Hedley Davison, Tritlington Hall, Morpeth, Gelding, "Gimlet,"	
H. C., John Dickinson, Chesterwood, Haydon Bridge, Mare, "Lady Armstrong."	

EXTRA HORSES.

Commended.

William Webster, Fairlaw, Ayton, Mare, "Lightfoot,"	Silver Medal,	0	16
William Watson Campbell, M.D., Dunse, Gelding, "Bryan O'Linn,"	Silver Medal,	0	16

PONIES.

SECTION 17. HIGHLAND STALLIONS, 14½ hands high and under  
No Entry.

SECTION 18. HIGHLAND MARES or GELDINGS between 13 and  
14½ hands high.

1. No Award.					
2. George Nisbet, Rumbleton, Greenlaw, Mare, "Her Grace,"	.	.	3	0	0

SECTION 19. MARES or GELDINGS between 12½ and 14 hands  
high.

1. Thomas Elliot, Hindhope, Jedburgh, Gelding, "The Shepherd,"	.	.	6	0	0
2. Lord Polwarth, Mertoun House, St Boswells, Mare, "Gift,"	.	.	3	0	0
3. Lionel Maitland Kirwan, Bellrigg, Castle Douglas, Mare, "Fanny,"	.	.	1	0	0
C., John Brown, East Housebyre, Galashiels, Mare, "Maggie,"					

SECTION 20. MARES or GELDINGS under 12½ hands high.

1. Robert Ramsey, Kippilaw, Newtown St Boswells, Mare, "Tuffy,"	.	.	6	0	0
2. Robert Kay, Linton Bankhead, Kelso, Mare, "Annie,"	.	.	3	0	0
3. G. H. Nicoll, Dundee, Mare, "Pettie,"	.	.	1	0	0
C., Andrew Thomson of Mainhill, St Boswells, Mare, "Flossie."					

£894 8 0

CLASS III.—SHEEP.

CHEVIOT.

SECTION 1. TUPS, 8 Shear and upwards.

1. John A. Johnstone, Archbank, Moffat,	.	.
2. Thomas Elliot, Hindhope, Jedburgh,	.	.

Carry forward, £12 0 0

3. John A. Johnstone, Archbank, Moffat, . . . . .	Brought forward, . . . . .	£12 0 0
V. H. C., Robert Laidlaw, Rodono, Selkirk. H. C., Thomas Elliot, Hindhope, Jedburgh. C., Thomas Elliot, Hindhope, Jedburgh.		2 0 0

## SECTION 2. TUPS, 2 Shear.

1. Thomas Elliot, Hindhope, Jedburgh, . . . . .	12 0 0
2. James Brydon, Kinnelhead, Moffat, . . . . .	8 0 0
3. John A. Johnstone, Archbank, Moffat, . . . . .	4 0 0
V. H. C., James Brydon, Kinnelhead, Moffat. H. C., John A. Johnstone, Archbank, Moffat. C., John A. Johnstone, Archbank, Moffat.	

## SECTION 3. SHEARLING TUPS.

1. Thomas Elliot, Hindhope, Jedburgh, . . . . .	12 0 0
2. James Brydon, Kinnelhead, Moffat, . . . . .	8 0 0
3. James Brydon, Kinnelhead, Moffat, . . . . .	4 0 0
V. H. C., John A. Johnstone, Archbank, Moffat. H. C., Thomas Elliot, Hindhope, Jedburgh. C., Thomas Elliot, Hindhope, Jedburgh.	

## SECTION 4. Pens of 5 EWES, above 1 Shear, with Lambs.

1. Thomas Elliot, Hindhope, Jedburgh, . . . . .	10 0 0
Thomas Elliot, Hindhope, Jedburgh, . . . . .	5 0 0
3. John Robson, Birness, Otterburn, Northumberland, . . . . .	2 0 0

## LAMBS.

1. Thomas Elliot, Hindhope, Jedburgh, . . . . .	2 0 0
2. Thomas Elliot, Hindhope, Jedburgh, . . . . .	1 0 0
C., John Robson, Otterburn, Northumberland.	

## SECTION 5. Pens of 5 SHEARLING EWES or GIMMERS.

1. Thomas Elliot, Hindhope, Jedburgh, . . . . .	10 0 0
2. Thomas Elliot, Hindhope, Jedburgh, . . . . .	5 0 0
3. John Robson, Birness, Otterburn, Northumberland, . . . . .	2 0 0
C., Sir G. Graham Montgomery of Stanhope, Bart.	

## BLACKFACED.

## SECTION 6. TUPS, 3 Shear and upwards.

1. David Foyer, Knowehead, Campsie, . . . . .	8 0 0
2. John Craig, South Halls, Strathaven, . . . . .	4 0 0
3. John M'Intyre and John M'Onie, Ballygreggan, North Moll, Campbeltown, . . . . .	2 0 0
V. H. C., John Fleming, Ploughland, Strathaven. H. C., John Fleming, Ploughland, Strathaven. C., David Foyer, Knowehead, Campsie.	

## SECTION 7. TUPS, 2 Shear.

1. David Foyer, Knowehead, Campsie, . . . . .	12 0 0
2. John Fleming, Ploughland, Strathaven, . . . . .	8 0 0
3. John Craig, South Halls, Strathaven, . . . . .	4 0 0
V. H. C., Patrick Melrose, West Loch, Eddlestone. H. C., James Duncan of Benmore, Blairmore. C., James Gray, Harperigg, Mid-Calder.	

## SECTION 8. SHEARLING TUPS.

1. David Foyer, Knowehead, Campsie, . . . . .	12 0 0
2. David Foyer, Knowehead, Campsie, . . . . .	8 0 0
3. John Fleming, Ploughland, Strathaven, . . . . .	4 0 0
V. H. C., John Fleming, Ploughland, Strathaven. H. C., James Craig, Monktonhill, Monkton. C., David Foyer, Knowehead, Campsie.	

## SECTION 9. Pens of 5 EWES, above 1 Shear, with Lambs.

1. Patrick Melrose, West Loch, Eddlestone, . . . . .	10 0 0
2. Matthew Henderson, The Hope, Allendale Town, . . . . .	5 0 0
3. James Duncan, Benmore Home Farm, Greenock, . . . . .	2 0 0
V. H. C., Matthew Henderson, The Hope, Allendale Town.	

## LAMBS.

1. James Duncan, Benmore Home Farm, Greenock, . . . . .	2 0 0
2. Patrick Melrose, West Loch, Eddlestone, . . . . .	1 0 0

Carry forward, £181 0 0



Brought forward, £181 0 0

## SECTION 10. Pens of 5 SHEARLING EWES or GIMMERS.

1. James Duncan, Benmore Home Farm, . . . . .	10 0 0
2. Matthew Henderson, The Hope, Allendale Town, . . . . .	5 0 0
3. Matthew Henderson, The Hope, Allendale Town, . . . . .	2 0 0
V. H. C., John T. Dodd, Catcleugh, Otterburn	

## BORDER LEICESTER.

## TWEEDDALE GOLD MEDAL.—Best BORDER LEICESTER Tup in the Yard.

Robert Fender, Northfield, Coldingham, . . . . .	20 0 0
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## SECTION 11. TUPS 3 Shear and upwards.

1. Robert Fender, Northfield, Coldingham, . . . . .	8 0 0
2. Andrew Smith, Castlemains, Gifford, . . . . .	4 0 0
3. Alexander Bain, Legara, Stitchell, Kelso, . . . . .	2 0 0
V. H. C., Andrew Smith, Castlemains, Gifford. H. C., Robert Calder, Little Swinton, Coldstream.	

## SECTION 12. TUPS, 2 Shear.

1. Samuel Jack, Mersington, Coldstream, . . . . .	12 0 0
2. Richard Tweedie, The Forest, Catterick, . . . . .	8 0 0
3. John Ainslie, Hillend, Loanhead, Edinburgh, . . . . .	4 0 0

## SECTION 13. SHEARLING TUPS.

1. Thomas Clark, Oldhamstocks Mains, Cockburnspath, . . . . .	12 0 0
2. Arthur James Balfour of Whittinghame, M.P., Prestonkirk, . . . . .	8 0 0
3. Robert Wallace, Auchanbraun, Mancline, . . . . .	4 0 0
V. H. C., Samuel Jack, Mersington, Coldstream. H. C., Thomas Hume, Wormerlaw, Coldstream. C., Arthur James Balfour of Whittinghame, M.P., Prestonkirk.	

## SECTION 14. Pens of 5 EWES above 1 Shear.

1. Robert Calder, Little Swinton, Coldstream, . . . . .	10 0 0
2. James Nisbet of Lambden, Greenlaw, . . . . .	5 0 0
3. Richard Tweedie, The Forest, Catterick, . . . . .	2 0 0
V. H. C., Arthur James Balfour, M.P., of Whittinghame, Prestonkirk.	

## SECTION 15. Pens of 5 SHEARLING EWES or GIMMERS.

1. George Simson, Courthill, Kelso, . . . . .	10 0 0
2. Thomas Clark, Oldhamstocks Mains, Cockburnspath, . . . . .	5 0 0
3. Robert Kay, Linton Bankhead, Kelso, . . . . .	2 0 0
V. H. C., Robert Calder, Little Swinton, Coldstream. H. C., Charles E. Hay, Brad-House, Belford, Northumberland. C., James Nisbet of Lambden, Greenlaw.	

## SECTION 16. Pens of 1 Aged TUP, 2 EWES, 2 GIMMERS, 2 EWE LAMBS, and 2 SHEARLING TUPS. The Ewes to have Lambs in Season 1880, and all bred by Exhibitor, except Aged Tup.

1. Thomas Clark, Oldhamstocks Mains, Cockburnspath, . . . . .	15 0 0
2. John Thompson, Bailieknowe, Kelso, . . . . .	10 0 0
3. James Nisbet of Lambden, Greenlaw, . . . . .	5 0 0
V. H. C., Robert Calder, Little Swinton, Coldstream.	

## LEICESTER.

## SECTION 17. TUPS above 1 Shear.

1. Thomas Smith, Powrie, Dundee, . . . . .	3 0 0
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## SECTION 18. SHEARLING TUPS.

3. Thomas Smith, Powrie, Dundee, . . . . .	3 0 0
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## SECTION 19. Pens of 5 EWES above 1 Shear.—No Entry.

## SECTION 20. Pens of 5 SHEARLING EWES or GIMMERS.—No Entry.

## COTSWOLD AND LINCOLN.

## SECTION 21. TUPS above 1 Shear.

1. Simon Beattie, Preston Hall, Annan (Cotswold), . . . . .	3 0 0
2. Francis Gibson, Woolmet, Dalkeith (Cotswold), . . . . .	2 0 0

Carry forward, £355 0 0

Brought forward, £355 0 0

## SECTION 22. SHEARLING TUPS.

1. Simon Beattie, Preston Hall, Annan (Cotswold), . . . . . 3 0 0

## SECTION 23. Pens of 5 EWES above 1 Shear.

1. Francis Gibson, Woolmet, Dalkeith (Cotswold), . . . . . 3 0 0

## SECTION 24. Pen of 5 SHEARLING EWES or GIMMERS.—Not forward.

## SHORT WOOLLED (SHROPSHIRE).

## SECTION 25. TUPS above 1 Shear.

1. The Earl of Zetland, Aske, Richmond, Yorkshire, . . . . . 3 0 0  
 2. Lord Polwarth, Humble, Upper Keith, . . . . . 2 0 0  
 3. Simon Beattie, Preston Hall, Annan, . . . . . 1 0 0  
 C., The Earl of Mansfield, K.T., Scone Palace, Perth.

## SECTION 26. SHEARLING TUPS.

1. Lord Polwarth, Humble, Upper Keith, . . . . . 3 0 0  
 2. The Earl of Strathmore, Glamis Castle, Forfar, . . . . . 2 0 0  
 3. The Earl of Zetland, Aske, Richmond, Yorkshire, . . . . . 1 0 0  
 V. H. O., The Earl of Strathmore, Glamis Castle, Forfar. H. C., The Earl of Strathmore, Glamis Castle, Forfar. C., Francis Gibson, Woolmet, Dalkeith.

## SECTION 27. Pens of 5 EWES above 1 Shear.

1. Francis Gibson, Woolmet, Dalkeith, . . . . . 3 0 0  
 2. Simon Beattie, Preston Hall, Annan, . . . . . 2 0 0  
 3. Lord Polwarth, Humble, Upper Keith, . . . . . 1 0 0

## SECTION 28. Pens of 5 SHEARLING EWES or GIMMERS.

1. The Earl of Zetland, Aske, Richmond, Yorkshire, . . . . . 3 0 0  
 2. The Earl of Strathmore, Glamis Castle, Forfar, . . . . . 2 0 0  
 3. Francis Gibson, Woolmet, Dalkeith, . . . . . 1 0 0

## EXTRA SECTIONS.

## SECTION 29. Pens of 5 CHEVIOT Wethers, not above 3 Shear.

1. Thomas Elliot, Hindhope, Jedburgh, . . . . . 4 0 0

## SECTION 30. Pens of 5 BLACKFACED WETHERS, not above 4 Shear.

1. Thomas Roy, Ballendrick, Bridge of Earn, . . . . . 4 0 0

## SECTION 31. Pens of 5 HALF-BRED WETHER HOGGS, not above 1 Shear.

1. Robert Logan, Birkenside, Earleton, . . . . . 4 0 0

## SECTION 32. Pens of 5 CROSS-BRED WETHER HOGGS, not above 1 Shear.—No Entry.

## EXTRA SHEEP.

## Highly Commended.

- Breton Tup, The Marquis of Lothian, K.T., Monteviot, Jedburgh, Silver Medal, 0 16 0  
 Breton Tup, The Marquis of Lothian, K.T., . . . . . Silver Medal, 0 16 0  
 Five Breton Ewes and five Lambs, The Marquis of Lothian, K.T., Silver Medal, 0 16 0

£399 8 0

## CLASS IV.—SWINE.

## LARGE BREED.

## SECTION 1. BOARS.

1. The Earl of Ellesmere, Worsley Hall, Manchester, . . . . . 8 0 0  
 2. Thomas Wight, Pilmuir, Lauder, . . . . . 4 0 0

Carry forward, £12 0 0

Brought forward, £12 0 0

## SECTION 2. SOWS.

1. The Earl of Ellesmere, Worsley Hall, Manchester,	6 0 0
2. William Macdonald, Woodlands, Perth,	3 0 0
3. Somner Logan, Birkenside, Earleton,	1 0 0

## SECTION 3. Pens of 3 PIGS, not above 8 months old.

1. The Earl of Ellesmere, Worsley Hall, Manchester,	4 0 0
2. Dr John Batty Tukey, Saughton Hall, Edinburgh,	2 0 0
3. Robert Wallace, Anchenbrain, Mauchline,	1 0 0
H. C., Dr John Batty Tukey, Saughton Hall, Edinburgh,	

## BLACK or BERKSHIRE.

## SECTION 4. BOARS.

1. C. E. Duckering, Whitehoe, Kirton Lindsey,	8 0 0
2. C. E. Duckering, Whitehoe, Kirton Lindsey,	4 0 0
3. Benjamin St John Ackers, Prinknash Park, Painswick,	2 0 0

## SECTION 5. SOWS.

1. C. E. Duckering, Whitehoe, Kirton Lindsey,	6 0 0
2. C. E. Duckering, Whitehoe, Kirton Lindsey,	3 0 0
3. Benjamin St John Ackers, Prinknash Park, Painswick,	1 0 0

## SECTION 6. Pens of 3 PIGS, not above 8 months old.

1. C. E. Duckering, Whitehoe, Kirton Lindsey,	4 0 0
2. C. E. Duckering, Whitehoe, Kirton Lindsey,	2 0 0

## SMALL BREED.

## SECTION 7. BOARS.

1. The Earl of Ellesmere, Worsley Hall, Manchester,	8 0 0
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## SECTION 8. SOWS.

1. James Duncan of Benmore Home Farm, Greenock,	6 0 0
2. The Earl of Ellesmere, Worsley Hall, Manchester,	3 0 0

## SECTION 9. Pens of 3 PIGS, not above 8 months old.

1. The Earl of Ellesmere, Worsley Hall, Manchester,	4 0 0
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## EXTRA SWINE.

## Highly Commended.

Six Pigs, C. E. Duckering, Whitehoe, Kirton, Lindsey,	Silver Medal,	0 16 0
		<u>£80 16 0</u>

## CLASS V.—POULTRY.

DORKING, Silver Grey.	Cock.—1. Francis Gibson, Woolmet, Dalkeith,	£1 0 0
	2. James Cranston, Holystone, Thornhill,	0 10 0
DORKING, Silver Grey.	2 Hens.—1. Alex. M'Ara, Culdees, Muthill, Perthshire,	1 0 0
	2. James Cranston, Holystone, Thornhill,	0 10 0
DORKING, Silver Grey.	Cockerel.—1. Admiral Maitland Dougall of Scotsraig,	1 0 0
	2. James Cranston, Holystone, Thornhill,	0 10 0
DORKING, Silver Grey.	2 Pullets.—1. Patrick Gardiner, Newbiggin, Auchterarder,	1 0 0
	2. Walter Owens, Torr, Castle Douglas,	0 10 0
DORKING, Cold.	Cock.—Not forward.	
DORKING, Cold.	2 Hens.—Not forward.	
DORKING, Cold.	Cockerel.—1. Sir George Macpherson Grant, Bart., M.P., The Castle, Ballindalloch,	1 0 0
	2. T. & J. M'Arthur, 64 Stirling Street, Alva,	0 10 0
DORKING, Cold.	2 Pullets.—1. Sir George Macpherson Grant, Bart., M.P., The Castle, Ballindalloch,	1 0 0

Carry forward, £8 10 0

		Brought forward,	£s 10 0
COCHIN-CHINA.	Cock.—1. James Stoola, 62 North Church Street, Dundee,		1 0 0
	2. William Street, Stirling,		0 10 0
COCHIN-CHINA.	2 Hens.—Not forward.		
COCHIN-CHINA.	Cockerel.—1. T. & J. M'Arthur, 64 Stirling Street, Alva,		1 0 0
COCHIN-CHINA.	2 Pullets.—1. T. & J. M'Arthur, 64 Stirling Street, Alva,		1 0 0
BRAHMAPOOTRA.	Cock.—1. William Nicoll, jun., 148 Scouringburn, Dundee,		1 0 0
	2. Miss Lucy Hunter, Antons Hill, Goldstream,		0 10 0
BRAHMAPOOTRA.	2 Hens.—1. John Sandeman, 15 Strathmartine Road, Dundee,		1 0 0
BRAHMAPOOTRA.	Cockerel.—1. No award.		
	2. T. & J. M'Arthur, 64 Stirling Street, Alva,		0 10 0
BRAHMAPOOTRA.	2 Pullets.—T. & J. M'Arthur, 64 Stirling Street, Alva,		1 0 0
SPANISH.	Cock.—No entry.		
SPANISH.	2 Hens.—1. William Street, Stirling,		1 0 0
SPANISH.	Cockerel.—1. James Norval, Hawkhill, Alloa,		1 0 0
	2. Thomas T. Charlton, Browdeanlaws, Jedburgh,		0 10 0
SPANISH.	2 Pullets.—1. No award.		
	2. James Norval, Hawkhill, Alloa,		0 10 0
SCOTCH GREY.	Cock.—1. Thomas Clarkson, Caledonian Tile Works, Braidwood, Carlisle,		1 0 0
	2. Andrew Reid, Netherton, Carmichael, Thankerton,		0 10 0
SCOTCH GREY.	2 Hens.—1. Thomas Clarkson, Caledonian Tile Works, Braidwood, Carlisle,		1 0 0
	2. W. R. Park, Abbotsmeadow, Melrose,		0 10 0
SCOTCH GREY.	Cockerel.—1. Alexander Hamilton, Braidwood Tile Works, Carlisle,		1 0 0
	2. W. R. Park, Abbotsmeadow, Melrose,		0 10 0
SCOTCH GREY.	2 Pullets.—1. Alexander Hamilton, Braidwood Tile Works, Carlisle,		1 0 0
	2. W. R. Park, Abbotsmeadow, Melrose,		0 10 0
HAMBURG, Pencilled Cock.	—1. A. Warwick, Outerwoodhead, Canonbie,		1 0 0
	2. James Musgrave, Marquis of Granby Inn, Longtown,		0 10 0
HAMBURG, Pencilled.	2 Hens.—1. A. Warwick, Outerwoodhead, Canonbie,		1 0 0
HAMBURG, Pencilled.	Cockerel.—1. A. Warwick, Outerwoodhead, Canonbie,		1 0 0
	2. James Musgrave, Marquis of Granby Inn, Longtown,		0 10 0
HAMBURG, Pencilled.	2 Pullets.—1. A. Warwick, Outerwoodhead, Canonbie,		1 0 0
HAMBURG, Spangled Cock.	—1. A. Warwick, Outerwoodhead, Canonbie,		1 0 0
	2. J. R. Alexander Rae, Park Terrace, Hamilton,		0 10 0
HAMBURG, Spangled.	2 Hens.—1. W. R. Park, Abbotsmeadow, Melrose,		1 0 0
	2. A. Warwick, Outerwoodhead, Canonbie,		0 10 0
HAMBURG, Spangled.	Cockerel.—1. W. R. Park, Abbotsmeadow, Melrose,		1 0 0
HAMBURG, Spangled.	2 Pullets.—1. W. R. Park, Abbotsmeadow, Melrose,		1 0 0
POULTRY—Any other Pure Breed.	Cock.—1. W. R. Park, Abbotsmeadow, Melrose (Creve Cœur),		1 0 0
	2. James Falconer, St Ann's, Lasswade, (Langaham),		0 10 0
POULTRY—Any other Pure Breed.	2 Hens.—1. W. R. Park, Abbotsmeadow, Melrose (Creve Cœur),		1 0 0
POULTRY—Any other Pure Breed.	Cockerel.—1. W. R. Park, Abbotsmeadow, Melrose (Creve Cœur),		1 0 0
POULTRY—Any other Pure Breed.	2 Pullets.—1. No award.		
	2. W. R. Park, Abbotsmeadow, Melrose (Creve Cœur),		0 10 0
GAME—Black or Brown Reds.	Cock.—1. D. Harley, Hillwood, Ratho,		1 0 0
	2. D. Harley, Hillwood, Ratho,		0 10 0
GAME—Black or Brown Reds.	1 Hen.—1. John Brough, 22 London Road, Carlisle,		1 0 0
	2. James Falconer, St Ann's, Lasswade,		0 10 0
GAME—Black or Brown Reds.	Cockerel.—1. James Falconer, St Ann's, Lasswade,		1 0 0
	2. D. Harley, Hillwood, Ratho,		0 10 0

Carry forward, £48 10 0

		Brought forward,	£43 10 0
GAME—Black or Brown Reds.	1 Pullet.—1. D. Harley, Hillwood, Ratho,	1 0 0	
	2. D. Harley, Hillwood, Ratho,	0 10 0	
GAME—Any other Pure Breed.	Cock.—1. D. Harley, Hillwood, Ratho (Duckwing),	1 0 0	
	2. James Falconer, St Ann's, Lasswade (Pile),	0 10 0	
GAME—Any other Pure Breed.	1 Hen.—1. D. Harley, Hillwood, Ratho (Duckwing),	1 0 0	
	2. D. Harley, Hillwood, Ratho (Duckwing),	0 10 0	
GAME—Any other Pure Breed.	Cockerel.—1. D. Harley, Hillwood, Ratho (Duckwing),	1 0 0	
	2. James Musgrave, Marquis of Granby Inn, Longtown (Lemon Pile),	0 10 0	
GAME—Any other Pure Breed.	1 Pullet.—1. D. Harley, Hillwood, Ratho (Duckwing),	1 0 0	
	2. James Musgrave, Marquis of Granby Inn, Longtown (Lemon Pile),	0 10 0	
BANTAMS—Game.	Cock.—1. Alexander Frew, Kirkcaldy,	1 0 0	
	2. James Falconer, St Ann's, Lasswade,	0 10 0	
BANTAMS—Game.	1 Hen.—1. D. Harley, Hillwood, Ratho,	1 0 0	
	2. Miss Jane M. Frew, Kirkcaldy,	0 10 0	
BANTAMS—Game.	Cockerel.—1. James Falconer, St Ann's, Lasswade,	1 0 0	
	2. J. D. Donald, 48 King Street, Montrose,	0 10 0	
BANTAMS—Game.	1 Pullet.—1. James Falconer, St Ann's, Lasswade,	1 0 0	
	2. J. D. Donald, 48 King Street, Montrose,	0 10 0	
BANTAMS—Sebright.	Cock.—1. Miss Bessie P. Frew, Kirkcaldy,	1 0 0	
BANTAMS—Sebright.	2 Hens.—1. Frederick Lewis Roy of Nenthorn, Kelso,	1 0 0	
	2. Miss Robina Frew, Kirkcaldy,	0 10 0	
BANTAMS—Sebright.	Cockerel.—No Entry.		
BANTAMS—Sebright.	2 Pullets.—No Entry.		
BANTAMS—Any other Pure Breed.	Cock.—1. Miss Rachel C. Frew, Kirkcaldy (Cuckoo),	1 0 0	
BANTAMS—Any other Pure Breed.	2 Hens.—1. J. D. Donald, 48 King Street, Montrose (Black Rose Comb),	1 0 0	
	2. No Award.		
BANTAMS—Any other Pure Breed.	Cockerel.—1. Mrs Frew, Sinclairton, Kirkcaldy (Black),	1 0 0	
	2. A. Alexander, West Linton (Black),	0 10 0	
BANTAMS—Any other Pure Breed.	2 Pullets.—1. No Award.		
	2. Robert Frew, sen., Kirkcaldy (Black),	0 10 0	
DUCKS—White Aylesbury.	Drake.—1. D. Harley, Hillwood, Ratho,	1 0 0	
DUCKS—White Aylesbury.	1 Duck.—1. D. Harley, Hillwood, Ratho,	1 0 0	
DUCKS—White Aylesbury.	Drake (Young).—1. William Hood, Edgerston Riggs, Jedburgh,	1 0 0	
	2. William H. Glass, St John Lane, Hamilton,	0 10 0	
DUCKS—White Aylesbury.	1 Duckling.—1. William H. Glass, St John Lane, Hamilton,	1 0 0	
DUCKS—Rouen.	Drake.—1. Admiral Maitland Dougall of Scotsraig, Tayport, Fife,	1 0 0	
	2. James and Walter Birch, Sefton, Seaforth, Liverpool,	0 10 0	
DUCKS—Rouen.	1 Duck.—1. Admiral Maitland Dougall of Scotsraig, Tayport, Fife,	1 0 0	
	2. James and Walter Birch, Sefton, Seaforth, Liverpool,	0 10 0	
DUCKS—Rouen.	Drake (Young).—1. Admiral Maitland Dougall of Scotsraig, Tayport, Fife,	1 0 0	
	2. James Blyth, Leckiebank, Auchtermuchty,	0 10 0	
DUCKS—Rouen.	1 Duckling.—1. James Blyth, Leckiebank, Auchtermuchty,	1 0 0	
	2. Admiral Maitland Dougall of Scotsraig, Tayport, Fife,	0 10 0	
DUCKS—Any other Pure Breed.	Drake.—1. Mrs Logan, Birkenhead, Earliston (Pekin),	1 0 0	
	2. James Duncan, Benmore Home Farm, Greenock (Muscovy),	0 10 0	
DUCKS—Any other Pure Breed.	1 Duck.—1. Mrs Logan, Birkenhead, Earliston (Pekin),	1 0 0	
	2. Miss Ormiston, Rutherford Mill, Kelso (Muscovy).	0 10 0	

Carry forward, £77 0 0

	Brought forward,	£77	0	0
DUCKS—Any other Pure Breed. Drakes (Young).—Mrs Logan, Birkenhead, Earliston (Pekin),		1	0	0
DUCKS—Any other Pure Breed. 1 Duckling.—I. Mrs Logan, Birkenhead, Earliston (Pekin),		1	0	0
2. James Duncan, Benmore Home Farm, Greenock, (Muscovy).		0	10	0
TURKEYS—Any Pure Breed—Cock.—I. A. Warwick, Outerwoodhead, Canonbie (Cambridge),		1	0	0
2. Admiral Maitland Dougall of Scotsraig, Tayport, Fife, (Black Norfolk),		0	10	0
TURKEYS—Any Pure Breed. 1 Hen.—I. James and Walter Birch, Sefton, Seaforth, Liverpool (Cambridge),		1	0	0
2. Admiral Maitland Dougall of Scotsraig, Tayport, Fife, (Black Norfolk),		0	10	0
TURKEYS—Any Pure Breed. Cock (Poult).—Not forward.				
TURKEYS—Any Pure Breed. 1 Hen (Poult).—Not forward.				
GEESE—Any Pure Breed. Gander.—James and Walter Birch, Sefton, Seaforth, Liverpool,		1	0	0
2. A. Warwick, Outerwoodhead, Canonbie (Grey Toulouse),		0	10	0
GEESE—Any Pure Breed. 1 Goose.—I. James and Walter Birch, Sefton, Seaforth, Liverpool,		1	0	0
2. A. Warwick, Outerwoodhead, Canonbie (Grey Toulouse),		0	10	0
GEESE—Any Pure Breed. Gander (Young).—I. A. Warwick, Outerwoodhead, Canonbie,		1	0	0
2. James Duncan, Benmore Home Farm (Toulouse),		0	10	0
GEESE—Any Pure Breed. 1 Gosling.—I. James and Walter Birch, Sefton, Seaforth, Liverpool,		1	0	0
2. A. Warwick, Outerwoodhead, Canonbie,		0	10	0
		<u>£88</u>	<u>10</u>	<u>0</u>

## CLASS VI.—WOOL.

## SECTION 1. Five Fleeces of CHEVIOT WHITE WOOL.

1. John Robson, Newton, Bellingham, Northumberland,	3	0	0
2. John Robson, Newton, Bellingham, Northumberland,	2	0	0
C., Adam Calkin, Halterburn, Kelso.			

## SECTION 2. Five Fleeces of BLACKFACED WHITE WOOL.

1. Matthew Henderson, Hope, Allendale Town,	3	0	0
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## SECTION 3. Five Fleeces of LEICESTER WOOL.

1. Richard Tweedie, The Forest, Catterick,	3	0	0
2. Adam Middlemas, Ancrum Craig, Jedburgh,	2	0	0
	<u>£13</u>	<u>0</u>	<u>0</u>

## CALEDONIAN APIARIAN SOCIETY.

Grant to, for 1880,	£20	0	0	
David Wood, Benmore.—Observatory Hive,	Silver Medal,	0	16	0
James Johnstone, Teuch, Bee-Driving,	Silver Medal,	0	16	0
		<hr/>		
		£21	12	0

## ABSTRACT OF PREMIUMS.

Cattle,	£965	5	0
Horses,	894	8	0
Sheep,	399	8	0
Swine,	80	16	0
Poultry,	88	10	0
Wool,	12	0	0
Caledonian Apiarian Society,	21	12	0
	<u>£2462</u>	<u>19</u>	<u>0</u>

## LIST OF JUDGES.

**SHORTHORN.**—Robert Bruce, Manor House Farm, Great Smeaton, Northallerton; Robert Jefferson, Preston Hows, Whitehaven; Charles Smith, Whittinghame, Prestonkirk. •

**POLLED ANGUS OR ABERDEEN.**—Alexander F. Leslie, Braco, Keith; George Philip, Boynds, Keith Hall, Inverurie; George J. Walker, Hillside House, Portlethen, Aberdeen.

**GALLOWAY.**—James Gifford, Torhousekie, Bladnoch, Wigtownshire; John Thomson, 3 Abercromby Terrace, Castle-Douglas.

**AYRSHIRE.**—William Fleming, Tillichewan, Alexandria, N.B.; John Ritchie, Broadwood, Coyton, Ayrshire; Hugh Roger, Hillhead, Kilmarnock.

**HIGHLAND.**—Donald A. M'Diarmid, Killimore, Kilfinichen, Auchnacraig; John Mackintosh, South Kinnaird, Aviemore.

**FAT STOCK.**—James Deans, Dalkeith Park, Dalkeith; John H. Dickson of Corstorphine, Saughton Mains, Edinburgh.

**DRAUGHT STALLIONS AND ENTIRE COLTS.**—William Ford, Fenton Barns, Drem; John Galbraith, Croy Cunningham, Killearn; Thomas Kerr, Whitehill, Sanquhar.

**DRAUGHT MARES, FILLIES, AND GELDINGS.**—William Gray, Muncraig, Kirkcudbright; James Park, Dechmont, Cambuslang; William Renwick, Yoker Mains, Yoker, Glasgow.

**HUNTERS, ROADSTERS, PONTIES, AND EXTRA HORSES.**—Sir William Baillie of Polkemmet, Bart., Whitburn; Andrew Gillon of Wallhouse, Bathgate; John W. J. Paterson, Terrona, Langholm.

**CHEVIOT.**—James Archibald, Duddingstone, South Queensferry; J. B. Dudgeon, Crakaig, Golspie; Thomas Elliot, Blackhaugh, Gairbhiels.

**BLACKFACED.**—Robert Buchanan, High Letter, Killearn; James A. Gordon, Udale, Invergordon; John Hamilton, Conemish, Tyndrum.

**BORDER LEICESTER.**—L. C. Chrisp, Hawkhill, Alnwick; William S. Ferguson, Friarton, Perth; Charles Lyall, Old Montrose, Montrose.

**LEICESTER, COTSWOLD, LINCOLN, AND SHORT-WOOLLED.**—Thomas Ferguson, Kinnochtry, Coupar-Angus; Thomas Harris, Stonyland House, Bromsgrove.

**SWINE.**—The Judges of Fat Stock.

**POULTRY.**—James Dixon, North Park, Clayton, Bradford; John Young, Hallie Cottage, Kingsknowe, Slateford.

**WOOL.**—The Judges of the various Classes of Sheep.

## LIST OF ATTENDING MEMBERS.

**SHORTHORN.**—Frederick Lewis Roy of Nenthorn, Kelso; James Turnbull, Lempitlaw, Eastfield, Kelso.

**POLLED ANGUS OR ABERDEEN.**—George Pott of Potburn, Linthaughee, Jedburgh; Robert Robertson, Ladyrig, Kelso.

**GALLOWAY.**—James Nisbet of Lambden, Greenlaw; Thomas Hood, Coldstream Mains, Coldstream.

**AYRSHIRE.**—Lord Arthur Cecil, Orchardmains, Innerleithen; James Shaw, Skaithmuir, Coldstream.

**HIGHLAND.**—Lord Polwarth, Mertoun House, St Boswells; W. L. Blakie, Holydean, St Boswells.

**FAT STOCK AND SWINE.**—Sir George Waldie-Griffith of Hendersyde Park, Bart., Kelso; George Rutherford, Printonan, Coldstream.

**DRAUGHT STALLIONS AND ENTIRE COLTS.**—Sir John Marjoribanks of Lees, Bart., Coldstream; Robert Calder, Little Swinton, Coldstream.

**DRAUGHT MARES, FILLIES, AND GELDINGS.**—J. B. Boyd of Cherrytrees, Kelso; John Logan, Legerwood, Earlston.

**HUNTERS, ROADSTERS, PONTIES, AND EXTRA HORSES.**—Major Paton, yr. of Crailing, Jedburgh; John Wilson, Chapelhill, Cockburnspath.

**CHEVIOT.**—David Turnbull of Brieryards, Hawick; John Munro, Fairnington, Kelso.

**BLACKFACED.**—Robert Lang, yr. of Broadmeadows, Salkirk; John Johnstone, Kingledores, Crook, Biggar.

**BORDER LEICESTER.**—J. T. S. Elliot, yr. of Wolflee, Hawick; John Smith, Leaderfoot, Melrose.

**LEICESTER, COTSWOLD, LINCOLN, AND SHORT-WOOLLED.**—William Elliott Lockhart of Northwickbrae, Branksholme, Hawick; George Torrance, Sisterpath, Dunse.

**POULTRY.**—John Turnbull of Abbey St Bathans; James Smith, Chief Magistrate, Kelso.

## III.—DISTRICT COMPETITIONS.

## CATTLE.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT
<i>Upper Strathearn</i>	C. S. H. Drummond Moray of Abercairny	Shorthorn Bull Class II.†	£1 10s. & Med. SIL. Medal
	J. Maxtone Graham of Cultoquhey,	do. do.	2 0 0*
	J. M. Thomson of Balgowan	do. do.	0 10 0*
	Donald M'Laren, Ardvreich	Ayrshire Heifer	£3 & Med. SIL. Med.
	Donald M'Laren, Ardvreich	do.	2 0 0
	Lord Aveland, Glenartney Lodge	do.	1 0 0
<i>Formartine</i>	Col. Ramsay of Barra	Shorthorn Bull	Silver Medal
	William Duthie, Collynie	do. Class I.†	£4 & Med. SIL. Med.
	Alex. Davidson, Mains of Cairnbrogie	do. do.	3 0 0
	Alex. Davidson, Mains of Cairnbrogie	do. do.	1 0 0
	William Duthie, Collynie	do. Class II.	£3 & Med. SIL. Med.
	James Black, Bartholchapel	do. do.	2 0 0
	George Shepherd, Jr., Shethin	do. do.	1 0 0
	James Argo, Cairdseat	Polled Heifer	£3 & Med. SIL. Med.
	James Strath, Coldhome	do.	2 0 0
<i>Kinglassie</i>	James Argo, Cairdseat	do.	1 0 0
	Alexander Mitchell, Finmount	Shorthorn Bull Class II.	£3 & Med. SIL. Med.
	R. S. Aytoun of Inchdairnie	do. do.	2 0 0
	John Armour, Goatmilk	do. do.	1 0 0
	John Armour, Goatmilk	Shorthorn Heifer	£3 & Med. SIL. Med.
	David Bowman, Manorleys	do.	2 0 0
	A. Bennet, Bogside	do.	1 0 0
<i>County of Ayr</i>	Vote in aid of Premiums		20 0 0
	John Ritchie, Broadwood	Ayrshire Cow	Silver Medal
	Duke of Buccleuch and Queensberry	Ayrshire Bull	Med. SIL. Med.
	James Picken, Laigh Langside	Draught Mare	Med. SIL. Med.
	Andrew Montgomery, Boreland	Entire Colt	Med. SIL. Med.
<i>Central Banffshire</i>	Duke of Richmond and Gordon	Shorthorn Bull	Silver Medal
	K.G.	do.	0 16 0
	James M'William, Stoneytown	do. Class II.	£3 & Med. SIL. Med.
	Mrs Kinloch Grant, Arndilly	do. do.	2 0 0
	Alexander Birnie, Belnagarrow	do. do.	1 0 0
	William M. Skinner, Drumin	Polled Heifer	£3 & Med. SIL. Med.
	John Hannay, Gavenwood	do.	2 0 0
<i>Stirling-shire</i>	John Hannay, Gavenwood	do.	1 0 0
	George Campbell, Gallangad	Ayrshire Bull	Class I. £4 & Med. SIL. Med.
	Duncan Keir, Buchlyvie	do.	3 0 0
	James Kay, Hillhead	do.	1 0 0
	William M'Keich, Woodend	do. Class II.	£3 & Med. SIL. Med.
	James Sands, Greenfoot	do. do.	2 0 0
	Duncan Keir, Buchlyvie	do. do.	1 0 0
	James Christie, Bandedath	Shorthorn Heifer	£3 & Med. SIL. Med.
	J. T. S. Paterson, Plean	do.	2 0 0
	Alex. Buchanan, Whitehouse,	do.	1 0 0

Carry forward, £103 5 6

\* Half Premiums awarded, the number of Lots being under five.

† Aged Bulls.

‡ Two-year-old Bulls.



				Brought forward, £103 5 6		
<i>Islands of Mull Coll and Tiree</i>	Peter Underwood, Ardnacross	Highland Bull		Silver Medal	0 16 0	
	Captain Cheape, Ardara	do	Class I. £2 & Med.	SIL Med.	2 10 6*	
	Walter Elliot, Laggan	do.	do.	.	1 10 0*	
	Col. Gardyne of Glenforsa	do.	do.	.	0 10 0*	
	T. P. Parr of Killiechronan	Highland Bull	Class I. £3 & Med.	SIL Med.	3 10 6	
	Col. Gardyne of Glenforsa	do.	do.	.	2 0 0	
	Col. Gardyne of Glenforsa	do.	do.	.	1 0 0	
	Hector A. Campbell, Ardfenaig	Highland Heifer	£3 & Med.	SIL Med.	3 10 6	
	Hector A. Campbell, Ardfenaig	do.	.	.	2 0 0	
	Peter Underwood, Ardnacross	do.	.	.	1 0 0	
<i>Renfrewshire</i>	Wm. Bartlemore, Netherhouses	Ayrshire Bull		Silver Medal	0 16 0	
	Thomas Kerr, East Fulton	do.	Class I. £4 & Med.	SIL Med.	4 10 6	
	Sir M. R. Shaw-Stewart, Bart.	do.	do.	.	3 0 0	
	Mrs Douglas, Green	do.	do.	.	1 0 0	
	Robert Gillespie, Boylestone	do.	Class II. £3 & Med.	SIL Med.	3 10 6	
	John Speirs, Balgreen	do.	do.	.	2 0 0	
	Peter Holmes, Priestside	do.	do.	.	1 0 0	
	Sir M. R. Shaw-Stewart, Bart.	Ayrshire Heifer	£3 & Med.	SIL Med.	3 10 6	
	Alex. Love, Margarets Mill	do.	.	.	2 0 0	
	Sir M. R. Shaw-Stewart, Bart.	do.	.	.	1 0 0	
<i>Turriff</i>	Robert Niven, Bruckhills	Shorthorn Bull		Silver Medal	0 16 0	
	Walter Scott, Glendronach	do.	Class I.	Med. SIL Med.	0 10 6	
	A. F. Nares, Brucktor	do.	Class II.	Med. SIL Med.	0 10 6	
	John Craighead, Thomaston	Polled Heifer		Med. SIL Med.	0 10 6	
<i>Arondale</i>	Thomas Tennant, Strathaven	Ayrshire Bull		Silver Medal	0 16 0	
	J. A. Hamilton, Whitehawgate	do.	Class I.	Med. SIL Med.	0 10 6	
	Alex. Craig, Over Milton	do.	Class II.	Med. SIL Med.	0 10 6	
	John Steel, Waterhead	Ayrshire Heifer		Med. SIL Med.	0 10 6	
<i>Weem</i>	Robertson & Sons, Balechin,	Shorthorn Bull	Class I.	Med. SIL Med.	0 10 6	
	William Harris, Tirnie	do.	Class II.	Med. SIL Med.	0 10 6	
	Dr Reid, Aberfeldy	Shorthorn Heifer		Med. SIL Med.	0 10 6	
<i>Deeside</i>	George Hamilton of Skene	Polled Bull		Silver Medal	0 16 0	
	Gordon Watt, Mains of Park	Shorthorn Bull	Class I.	Med. SIL Med.	0 10 6	
	Wm. McCombie of Easter Skene	Polled Heifer		Med. SIL Med.	0 10 6	
<i>Lorn</i>	Neil Macdonald of Dunach	Highland Bull		Silver Medal	0 16 0	
	John M'Arthur, Barcaldine	do.	Class I.	Med. SIL Med.	0 10 6	
	John Brown, Dalnacabaig	do.	Class II.	Med. SIL Med.	0 10 6	
	Duncan M'Callum, Glenmackrie	Highland Heifer		Med. SIL Med.	0 10 6	

## HORSES FOR AGRICULTURAL PURPOSES.

<i>Lismahagou</i>	David Riddell, Blackhall	Stallion	.	.	.	.	.	25 0 0
<i>Carriek</i>	David Riddell, Blackhall	Stallion	.	.	.	.	.	25 0 0
<i>Cupar and St Andrews</i>	James Alexander, Mosswater	Stallion	.	.	.	.	.	25 0 0
<i>Dumfries Horse Association</i>		Stallion	.	.	.	.	.	25 0 0
<i>Nairnshire</i>	Peter M'Robbie, Sunnyside	Stallion	.	.	.	.	.	25 0 0
<i>Earl of Selkirk's Tenantry and District</i>	Andrew Montgomery, Boreland	Stallion	.	.	.	.	.	25 0 0

Carry forward, £304 11

Half Premiums awarded, the number of Lots being under five.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	Brought forward,	AMOUNT.
				£304 11 6
<i>Central Strath-carn</i>	John Marr, Cairnbrogie	Stallion		25 0 0
<i>Clack-mannan</i>	James M'Nab, Glenochil House	Brood Mare	£4 & Med. Sil. Med.	4 10 6
	Alex. Gall, Alloa	do.		3 0 0
	James Orr of Harvieston	do.		1 0 0
<i>Lockerbie</i>	Thomas Wright, Bengal	Brood Mare	£4 & Med. Sil. Med.	4 10 6
	John Common, Corriellaw	do.		3 0 0
	Thomas Wright, Bengal	do.		1 0 0
<i>East Dist. of Berwickshire</i>	Gavin Jack, Foulden Newton	Brood Mare	£4 & Med. Sil. Med.	4 10 6
	Robert Wood, Whitecross	do.		3 0 0
	Robert White, Cairncross	do.		1 0 0
<i>Lauderdale</i>	John W. Lawrie, Mitchelston	Brood Mare	£4 & Med. Sil. Med.	4 10 6
	John W. Lawrie, Mitchelston	do.		3 0 0
	John Bertram, Hartsdale	do.		1 0 0
<i>Machars</i>	Robt. M'Dowall, Auchengallie	Brood Mare	£4 & Med. Sil. Med.	4 10 6
	A. E. M'Cracken, Craiglemine	do.		3 0 0
	Alex. M'Whinnie, Aireyolland	do.		1 0 0
<i>County of Peebles</i>	Lord Arthur Cecil, Orchard Mains	Brood Mare	£4 & Med. Sil. Med.	4 10 6
	M. Dyer, Peebles	do.		3 0 0
	James Inch, Wester Deans	do.		1 0 0
<i>East Dist. of Strathkingshire</i>	Alexander Simpson, Westmains	Brood Mare	£4 & Med. Sil. Med.	4 10 6
	Carron Company, Carron	do.		3 0 0
	George Ure of Wheatlands	do.		1 0 0
<i>Easter Ross</i>	William Kelman, Balnagore	One-year old Colt	£1 & Med. Sil. Med.	1 10 6*
	John Forsyth, Achoyie	do.		0 10 0*
	John Gordon, Balmuchy	Two-year old Filly	£3 & Med. Sil. Med.	3 10 6
	Andrew Mackenzie, Dalmore	do.		2 0 0
	G. F. Irvine, Nigg	do.		1 0 0
	Alexander Munro, Ord	One-year old Filly	£2 & Med. Sil. Med.	2 10 6
	G. F. Irvine, Nigg	do.		1 0 0
	James Young, Cadboll	do.		0 10 0
<i>Dist. of Royal Northern</i>	Wm. Miller, Pond Cottage	Two-year old Colt	£3 & Med. Sil. Med.	3 10 6
	Robert Anderson, West Fingask	do.		2 0 0
	John Marr, Cairnbrogie	do.		1 0 0
	George Smith, Wester Carnie	One-year old Colt	£2 & Med. Sil. Med.	2 10 6
	James Tocher, Sauchenloan	do.		1 0 0
	James L. Rust, Bowbutts	do.		0 10 0
	David Walker, Coullie	Two-year old Filly	£3 & Med. Sil. Med.	3 10 6
	George Bean, Balquhain Mains	do.		2 0 0
	William Lobban, Ashtown	do.		1 0 0
	James Merson, Craigwillie	One-year old Filly	£2 & Med. Sil. Med.	2 10 6
	John Marr, Cairnbrogie	do.		1 0 0
	Alexander Innes, Alton	do.		0 10 0
<i>Dalbeattie</i>	Andrew Montgomery, Boreland	Two-year old Colt	£3 & Med. Sil. Med.	3 10 6
	Andrew Hyslop, Auchenreoch	do.		2 0 0
	James Shennan, Balig	do.		1 0 0
	Andrew Montgomery, Boreland	One-year old Colt	£2 & Med. Sil. Med.	2 10 6
	Andrew M'Dowall, Drumglass	do.		1 0 0
	William Little, High Borgue	do.		0 10 0
	Adam Gray, Ingleston	Two-year old Filly	£3 & Med. Sil. Med.	3 10 6
	James Cunningham, Tarbreoch	do.		2 0 0
	Andrew Montgomery, Boreland	do.		1 0 0
	George Craik, Glentoo	One year old Filly	£2 & Med. Sil. Med.	2 10 6
	R.D. Barré Cunningham, Duchrae	do.		1 0 0
	James M'Queen of Crofts	do.		0 10 0

Carry forward. £444 0 6

\*Half Premiums awarded, the Number of Lots being under five.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
		Brought forward,	£444 0 6
<i>Rhins Dist. of Wig-tounshires</i>	Andrew M'Dowall, Auchtralure	Two-year old Colt	£3 & Med. SIL. Med. 3 10 6
	John M'Master, Culhorn	do.	2 0 0
	Alexander Rankin, Aird	do.	1 0 0
	John Ralston, Milnain	One-year old Colt	£2 & Med. SIL. Med. 2 10 6
	W. W. Dorman, Deer Park	do.	1 0 0
	John Cochran, Portenacklie	do.	0 10 0
	Robert M'William, Craichmore	Two-year old Filly	£3 & Med. SIL. Med. 3 10 6
	Alex. Wylie, Mount Pleasant	do.	2 0 0
	W. W. Dorman, Deer Park	do.	1 0 0
	Robert Frederick, Drumflower	One-year old Filly	£2 & Med. SIL. Med. 2 10 6
	Allan M'Master, Glenhead	do.	1 0 0
	Alexander Rankin, Aird	do.	0 10 0
<i>Auchtermuchty</i>	G. C. Cheape of Strathtyrum	Two-year old Filly	£3 & Med. SIL. Med. 3 10 6
	William Ritchie, Lumquhat Mill	do.	2 0 0
	William Thom, Dampersstone	do.	1 0 0
	James Blyth, Leckiebank	One-year old Filly	£1 & Med. SIL. Med. 1 10 6
	James Tod, Easter Cash	do.	0 10 0*
	Thomas Webster, Bowhouse	do.	0 5 0*
<i>East of Fife</i>	James Drummond, Blacklaw	Two-year old Colt	£110. & Med. SIL. Med. 2 0 6*
	James Drummond, Blacklaw	do.	1 0 0*
	D. Carnegie, Pitcoorthie	do.	0 10 0*
	James Blyth, Leckiebank	One-year old Colt	£2 & Med. SIL. Med. 2 10 6
	James Blyth, Leckiebank	do.	1 0 0
	W. R. Fortune of Mulcambus	do.	0 10 0
	D. Edie, Cornceres	Two-year old Filly	£3 & Med. SIL. Med. 3 10 6
	James Blyth, Leckiebank	do.	2 0 0
	Sydney Wyatt, Nydie	do.	1 0 0
	J. Hill, Langside	One-year old Filly	£2 & Med. SIL. Med. 2 10 6
	James Blyth, Leckiebank	do.	1 0 0
	Robert Tivendale, New Pilmuir	do.	0 10 0

## SHEEP.

<i>Island of Arran</i>	James Allan, jun., Balnacoolie	Blackfaced Tup	Silver Medal	0 16 0
	Robert Crawford, Glenscorrodale	do.	£3 & Med. SIL. Med.	3 10 6
	James Allan, jun., Balnacoolie	do.	1 0 0	
	Robert Crawford, Glenscorrodale	do.	0 10 0	
	James Allan, jun., Balnacoolie	Blackfaced Shear. Tup	£3 & Med. SIL. Med.	3 10 6
	William Tod, Glenree	do.	1 0 0	
	James Allan, jun., Balnacoolie	do.	0 10 0	
	James Allan, jun., Balnacoolie	Blackfaced Ewes	£3 & Med. SIL. Med.	3 10 6
	James Allan, jun., Balnacoolie	do.	1 0 0	
	William Tod, Glenree	do.	0 10 0	
	James Allan, jun., Balnacoolie	Blackfaced Gimmers	£3 & Med. SIL. Med.	3 10 6
	James Allan, jun., Balnacoolie	do.	1 0 0	
	James Allan, sen., Clanchlands	do.	0 10 0	
<i>Islay, Jura, and Colonsay</i>	A. & J. W. Greenlees, Finlaggan	Blackfaced Tup	Silver Medal	0 16 0
	A. & J. W. Greenlees, Finlaggan	do.	£1, 10s. & Med. SIL. Med.	2 0 6*
	Samuel Mitchell, Nereby	do.	0 10 0*	
	A. & J. W. Greenlees, Finlaggan	do.	0 5 0*	
	A. M'Conechy, Daill	Blackfaced Shearling Tup	£3 & Med. SIL. Med.	3 10 6
	A. & J. W. Greenlees, Finlaggan	do.	1 0 0	
	A. & J. W. Greenlees, Finlaggan	do.	0 10 0	
	Samuel Mitchell, Nereby	Blackfaced Ewes	£3 & Med. SIL. Med.	3 10 6
	A. & J. W. Greenlees, Finlaggan	do.	1 0 0	
	A. M'Conechy, Daill	do.	0 10 0	
	A. M'Conechy, Daill	Blackfaced Gimmers	£3 & Med. SIL. Med.	3 10 6
	A. & J. W. Greenlees, Finlaggan	do.	1 0 0	
	Samuel Mitchell, Nereby	do.	0 10 0	

Carry forward, £581 11 6

\* Half Premiums awarded, the number of Lots being under Ave.

NAME OF DIST.	PREMIUM AWARDED TO		AMOUNT
<i>Dunoon</i>	James Duncan of Benmore, Blairmore	Blackfaced Tup	Brought forward, £531 11 6
	*James Duncan of Benmore	do.	Silver Medal 0 16
	John Macdonald of Garrachoran	do.	£3 & Med. Sil. Med. 3 10
	James Duncan of Benmore, Blairmore	do.	1 0
	J. Duncan, Ballimore	Blackfaced Shear. Tup	£3 & Med. Sil. Med. 3 10
	J. Duncan, Ballimore	do.	1 0
	John Macdonald of Garrachoran	do.	0 10
	James Duncan of Benmore	Blackfaced Ewes	£1, 10s. & Med. Sil. Med. 2 0 6*
	James Duncan of Benmore, Blairmore	do.	0 10 0*
	James Duncan of Benmore, Blairmore	Blackfaced Gimmers	£1, 10s. & Med. Sil. Med. 2 0 6*
	James Duncan of Benmore	do.	0 10 0*
	Archd. Clark, Inverchapple	do.	0 5
<i>Dalketh</i>	John Ainslie, jr., Hillend	Leicester Tup	Silver Medal 0 16 0
	John Ainslie, jr., Hillend	do.	£3 & Med. Sil. Med. 3 10 6
	Duke of Buccleuch and Queensberry, K.G.	do.	1 0 0
	John Edgar, Kirkclettle	do.	0 10 0
	William Wilson, Wolfstar	Leicester Shear. Tup	£3 & Med. Sil. Med. 3 10 6
	William Wilson, Wolfstar	do.	1 0 0
	Duke of Buccleuch and Queensberry, K.G.	do.	0 10 0
	Duke of Buccleuch and Queensberry, K.G.	Leicester Ewes	£3 & Med. Sil. Med. 3 10 6
	John Edgar, Kirkclettle	do.	1 0
	Richard Paterson, Langside	do.	0 10
	Duke of Buccleuch and Queensberry, K.G.	Leicester Gimmers	£3 & Med. Sil. Med. 3 10 6
	Duke of Buccleuch and Queensberry, K.G.	do.	1 0 0
	Richard Paterson, Langside	do.	0 10 0
<i>Upper Ward of Lanarkshire</i>	William White, Nisbet	Blackfaced Tup	£3 & Med. Sil. Med. 3 10 6
	James Greenshields, Westown	do.	1 0 0
	James Greenshields, Westown	do.	0 10 0
	Robert Watson, Culteralliers	Blackfaced Shearling Tup	£3 & Med. Sil. Med. 3 10 6
	Robert Watson, Culteralliers	do.	1 0 0
	James Greenshields, Westown	do.	0 10 0
	George Warnock, Todlaw	Blackfaced Ewes	£3 & Med. Sil. Med. 3 10 6
	Mrs D. Tweedie, Castle Crawford	do.	1 0 0
	Alex. Williamson, Stranclough	do.	0 10 0
	Mrs D. Tweedie, Castle Crawford	Blackfaced Gimmers	£1, 10s. & Med. Sil. Med. 2 0 6*
<i>Lochaber</i>	George Warnock, Todlaw	do.	0 10 0
	George Warnock, Todlaw	do.	0 5 0*
	H. E. Cameron, Clunes	Blackfaced Tup	Silver Medal 0 16 0
	D. P. M'Donald, Invernevis	do.	£3 & Med. Sil. Med. 3 10 6
	Donald Cameron of Lochiel, M.P.	do.	1 0 0
	G. S. Comrie, Auchendall	do.	0 10 0
	D. P. M'Donald, Invernevis	Blackfaced Shear. Tup	£3 & Med. Sil. Med. 3 10 6
	John Cameron, Inversanda	do.	1 0 0
	D. P. M'Donald, Invernevis	do.	0 10 0
	D. & J. Sinclair, Achintee	Blackfaced Ewes	£3 & Med. Sil. Med. 3 10 6
	G. G. Mackay, Glenfintail	do.	1 0 0
	John Linton, Cornanan	do.	0 10 0
	D. Macpherson, Glen Nevis	Blackfaced Gimmers	£3 & Med. Sil. Med. 3 10 6
	D. & J. Sinclair, Achintee	do.	1 0 0
	D. Macpherson, Glen Nevis	do.	0 10 0

Carry forward, £607 7 6

\* Half Premiums awarded, the number of Lots being under five.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
		Brought forward, £807 7 6	
<i>Lower</i>	William Struthers, Logan Mains	Leicester Tup	£1, 10s. & Med. Sil. Med. 2 0 6*
<i>Annandale</i>	Thomas Marshall, Howes	do.	0 10 0*
	Thomas Marshall, Howes	do.	0 5 0*
	William Struthers, Logan Mains	Leicester Ewes	£1, 10s. & Med. Sil. Med. 2 0 6*
	John Pool, Milnfield	do.	0 10 0*
	John Bell, Howrigg	do.	0 5 0*
	John Pool, Milnfield	Leicester Gimmers	£1, 10s. & Med. Sil. Med. 2 0 6*
	John Bell, Howrigg	do.	0 10 0*
	John Pool, Milnfield	do.	0 5 0*
<i>Northern</i>	James A. Gordon, Udale	Blackfaced Tup	Silver Medal 0 16
<i>Pastoral</i>	James A. Gordon, Udale	do.	Med. Silver Medal 0 10
<i>Club</i>	Peter Robertson, Achilty	Blackfaced Shear. Tup	Med. Silver Medal 0 10
	James A. Gordon, Udale	Blackfaced Ewes	Med. Silver Medal 0 10
	Peter Robertson, Achilty	Blackfaced Gimmers	Med. Silver Medal 0 10
<i>Nithsdale</i>	James Brydon, Holm	of } Cheviot Tup	Med. Silver Medal 0 10
	Dalquhain		
	James Brydon, Holm	of } Cheviot Shear. Tup	Med. Silver Medal 0 10 6
	Dalquhain		
	James Brydon, Kinnelhead	Cheviot Ewes	Med. Silver Medal 0 10 6
	James Brydon, Kinnelhead	Cheviot Gimmers	Med. Silver Medal 0 10 6
<i>Aithole and</i>	P. & D. Ferguson, Dalcapon	Leicester Tup	Silver Medal 0 16 0
<i>Weem</i>	P. & D. Ferguson, Dalcapon	do.	Med. Silver Medal 0 10 6
	P. & D. Ferguson, Dalcapon	Leicester Shear. Tup.	Med. Silver Medal 0 10 6
	P. & D. Ferguson, Dalcapon	Leicester Ewes	Med. Silver Medal 0 10 6
	P. & D. Ferguson, Dalcapon	Leicester Gimmers	Med. Silver Medal 0 10 6
<i>United</i>	} William Wilson, Wolfstar	Leicester Shear. Tup	Med. Silver Medal 0 10 6
<i>East</i>			
<i>Lothian</i>			
<i>Neither</i>	Mrs Gillies, Dunmore	Blackfaced Tup	Silver Medal 0 16 0
<i>Lorn</i>	Robert Allan, Glenmore	do.	Med. Silver Medal 0 10 6
	Mrs Gillies, Dunmore	Blackfaced Shear. Tup	Med. Silver Medal 0 10 6
	Robert Allan, Glenmore	Blackfaced Ewes	Med. Silver Medal 0 10 6
	Robert Allan, Glenmore	Blackfaced Gimmers	Med. Silver Medal 0 10 6
<i>Argyll</i>	John Malcolm of Poltalloch	Blackfaced Tup	Silver Medal 0 16 0
	R. Allan, Glenmore	do.	Med. Silver Medal 0 10 6
	R. Allan, Glenmore	Blackfaced Shear. Tup	Med. Silver Medal 0 10 6
	A. Sinclair, Upper Largie	Blackfaced Ewes	Med. Silver Medal 0 10 6
	A. Sinclair, Upper Largie	Blackfaced Gimmers	Med. Silver Medal 0 10 6
			<hr/> £629 18 6 <hr/>

## SPECIAL GRANTS.

<i>Glasgow Agricultural Society</i>	Vote in aid of Premiums,	£50 0 0
<i>Edinburgh Christmas Poultry and Root Club</i>	Vote in aid of Premiums,	25 0 0
<i>Joint Show at Dingwall of the Inverness, Wester Ross, Easter Ross, Black Isle and Northern Pastoral Clubs</i>	Vote in aid of Premiums,	25 0 0
<i>Ayrshire Association</i>	Vote to Dairy Produce Show at Kilmarnock,	20 0 0
<i>Westray Society</i>	Vote in aid of Premiums,	3 0 0
<i>Eglishay Society</i>	Vote in aid of Premiums,	3 0 0
<i>Unst Society</i>	Vote in aid of Premiums,	3 0 0
<hr/> £129 0 0 <hr/>		

Half Premiums awarded, the number of Lots being under five.

## MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

Medium Silver Medals were awarded to the following:—

## ABERDEENSHIRE.

NAME OF DISTRICT.	MEDAL AWARDED TO	FOR
<i>Donside</i>	James Rennie, Milltown of Fintray	Swedish Turnips
	James Rennie, Milltown of Fintray	Yellow Turnips
<i>Formartine</i>	J. H. Udney of Udney	Turnips
	William Stephen, Gilmorton	Potatoes
<i>Fyvie</i>	James Durno, Jackston	Shorthorn Cow
	James Durno, Jackston	Draught Mare
<i>Garioch</i>	William Gall, Smiddyburn	Cross Cow
	George Bean, Balquhain	Brood Mare
<i>Invergurie</i>	John Mathland, Balhaggarty	Swedish Turnips
	Henry Gordon of Manar	Yellow Turnips
<i>Kinellar</i>	Alexander Valentine, Roadside Cottage	Pen of Poultry
<i>Leochel Cushnie</i>	James Strachan, Wester Fowls	Polled Bull
	James Strachan, Wester Fowls	Polled Heifer
<i>New Aberdour</i>	John Bell, Tyrie Mains	Shorthorn Bull
	George Bruce, Pennan Farm	Shorthorn Cow
	Charles A. Barclay, Aberdour House	Draught Mare
	Alexander Lovie, Towie	Collection of Seeds
	William Cardno, Tillnamolt	Collection of Roots
<i>North East Aberdeenshire</i>	James Whyte, Cardno Mains	Polled Bull
	Samuel Stewart, Sandhole	Shorthorn Cow
	Alexander Beddie, Banks	Draught Mare
	Mrs Coutts, Hutton	Dairy Produce
	James Whyte, Cardno Mains	Sample of Seeds
	James Milne, Netherton	Collection of Roots

## ARGYLLSHIRE.

<i>Lismore</i>	Dugald M'Dougall, Balliveolan	Highland Cow
	Duncan M'Coll, Clachan	Draught Gelding
<i>Islands of Mull Coll, and Treas. Transferred from Lochbuy and West of Mull.</i>	Hector A. Campbell, Ardfenaig	Highland Heifer
	James N. Forsyth of Quinish	Blackfaced Gimmers
	Hector A. Campbell, Ardfenaig	Blackfaced Tup
	John M'Lean, Kengharair	Pony

## AYRSHIRE.

<i>Ardsrossan</i>	Robert Young, Yonderton	Cheese
	William Allan, Muirlaught	Cured Butter
<i>Cumnock</i>	James Gilmour, Orchardton	Ayrshire Bull
	James Murray, Muir	Ayrshire Cow
<i>Dalry</i>	Robert Kerr, High Linn	Ayrshire Bull
	James Craig, Holms of Caaf	Ayrshire Cow
	John Brown, Lissens Moss	Ayrshire Cow
	William & Dugald Paton, Hournt	Brood Mare
<i>Dalrymple</i>	James Blair, Holmes	Ayrshire Cow
	James Clelland, Balgreen	Draught Gelding
<i>Darvel</i>	John Nisbet, Long-green	Collection of Roots
	Thomas Morton, High Bowhill	Sweet Milk Cheese
<i>Dundonald</i>	James Young, Peatland	Ayrshire Bull
	David Stevenson, Auchengatt	Ayrshire Cow
	John Barr, Harperland	Clydesdale Mare
<i>Galston</i>	William Hodge, Hillhouse	Ayrshire Bull
	William Lindsay, Killoch	Ayrshire Cow
	James Picken, Laigh Langside	Clydesdale Mare
<i>Galston (Horticultural)</i>	Matthew Millar, Low Bowhill	Sweet Milk Cheese
	Agnes M'Dougal, Whiteside	Cured Butter
	George Neil, New Milne	Collection of Roots

NAME OF DISTRICT.	MEDAL AWARDED TO	FOR
<b>AYRESHIRE—continued.</b>		
<i>Loudoun &amp; Lanfine</i>	James Bowie, Overland	Ayrshire Bull
	Alexander Steel, Burnhead	Ayrshire Cow
	Alexander Barclay, Rigghead	Clydesdale Gelding
	James Mitchell, Cairnhill	Leicester Tup
<i>Sorn</i>	R. & P. Wardrop, Gariaff	Ayrshire Bull
	Peter Conner, Drumdow	Ayrshire Cow
	James Picken, Leigh Langaide	Clydesdale Mare
	Thomas B. Retson, Sorn	Pen of Poultry
<i>Sorn and Dalguin</i>	John Watson, Daldorch	Ayrshire Bull
	John Young, Leigh Brocklar	Ayrshire Cow
	James Baird, Blindburn	Clydesdale Mare
	Gavin Hamilton, Nethershields	Sweet Milk Cheese
	John Watson, Daldorch	Fences
<i>Stewarton</i>	James Ross, Titwood	Ayrshire Bull
	T. D. C. Graham of Dunlop House	Ayrshire Cow
<i>Tarbolton</i>	Hugh Wilson, Carnigillan	Ayrshire Cow
	William Spiers, Lochlie	Draught Mare
<i>West Kilbride</i>	James Caldwell, Blackshaw	Ayrshire Bull
	William Dunlop, Fences	Ayrshire Cow
<i>Spey, Avon, and Fiddochside</i>	C. A. Cantlie, Keithmore	Shorthorn Heifer
	W. M. Skinner, Drumin	Blackfaced Tup
	J. F. Inkson, Kinermory	Barley
	James Campbell, Pitrooy	Potatoes
<b>BUTESHIRE.</b>		
<i>Bute</i>	John Simpson, St Colmac	Ayrshire Cow
	Robert M'Allister, Ascog	Ayrshire Heifer
	Mrs Malcolm, Edinbeg	Blackfaced Tup
<b>DUMBERTONSHIRE.</b>		
<i>Cumbernauld</i>	John Park, Mainhead	Ayrshire Bull
	William Cullen, Barbegs	Ayrshire Cow
	Thomas Chalmers, Walton	Clydesdale Mare
<i>Western District of Dumbartonshire</i>	Robert Begg, Blarnyle	Ayrshire Bull
	Alexander M'Aulay, Helensburgh	Ayrshire Cow
<b>DUMFRIESSHIRE.</b>		
<i>Sanguhar</i>	Duke of Buccleuch and Queensberry, K.G.	Ayrshire Bull
	Duke of Buccleuch and Queensberry, K.G.	Ayrshire Heifer
	Samuel Irving, Carco	Draught Mare
	William Hyslop, jun., Glenries	Cheviot Tup
	J. & J. Moffat, Gateside	Blackfaced Tup
<b>EDINBURGESHIRE.</b>		
<i>Western District of Mid-Lothian</i>	John Metke, Seafeld	Ayrshire Bull
	James Hamilton, Woolfords	Ayrshire Cow
	John Waddell, Easter Inch	Clydesdale Entire Colt
	John Waddell, Easter Inch	Clydesdale Filly
<b>INVERNESS-SHIRE.</b>		
<i>Glen Urquhart</i>	James Simpson, Drumnadrochit	Sandy Oats
	Miss Grant, Dalshangee	Rock Potatoes
	Roderick Fraser, Kerrowdown	Swedish Turnips
<i>Northern Counties Fat Show Club</i>	Sir Kenneth S. Mackenzie of Gairloch, Bart.	Cross Ox
	James Stephen, Metke Geddes	Cross Heifer
	Earl of Seafeld, Balmacraan	Wethers
	Duncan Forbes of Culloden	Pig
	Duncan Ross, Hilton	Regent Potatoes
	Mrs Ferguson, Inverness	Poultry
<i>Strathglass</i>	George Mackenzie, Balmore	Sandy Oats
	Roderick M'Rae, Erchless	Finefellow Oats

NAME OF DISTRICT.	MEDAL AWARDED TO	
KINCARDINESHIRE.		
<i>Pettercairn</i>	George Stewart, Craigniston David Murray, Westinoston James Wallace, Balbegno	Shorthorn Bull Brood Mare Collection of Roots
LANARKSHIRE.		
<i>Cadder</i>	Thomas Stark, Auchinsairn James Johnstone, Lochburnie	Ayrshire Cow Draught Mare
<i>Carnwath</i>	John Mather, Lampits John Prentice, Grange William Muir, Easteralls J. Hamilton, Woolfords	Ayrshire Bull Draught Filly Leicester Tup Blackfaced Tup
<i>Carmichael</i>	R. Thorburn, Stonehill R. Weir, Watchknowe	Blackfaced Tup Leicester Tup
<i>Stonehouse</i>	Alexander Craig, Over Milton John Hamilton, Bogside	Ayrshire Bull Ayrshire Cow
ORKNEY.		
<i>Rousay</i>	General Burroughs of Rousay, C.B George Learmouth, Westness	Cross Heifer Brood Mare
PERTHSHIRE.		
<i>Culross</i>	John James Dalgleish, Brankston Grange William Beveridge, East Grange William Beveridge, East Grange	Hay Turnips Farm Management
<i>M. Dist. of Athole and Tullymet Stormont Union</i>	Mrs M'Donald, Balnaguard Sir Alex. Muir Mackenzie of Delvine, Bart. A. Bruce, Jordanstone John Granger, Pitcur Mrs Mitchell, Essendy William M'Laren, Pittendreich	Green Crop Highland Ox Brood Mare Leicester Tup Dairy Produce Green Crop
<i>Strathearn (Ornithological)</i>	John MacNab, Grieff Miss Agnes Paterson, Carnock	Dorking Fowls Scotch Grey Fowls
RENFREWSHIRE.		
<i>Faglesham Neilston</i>	James Stewart, Carrot John Holm, Jaapston John Holm, Jaapston	Ayrshire Cow Ayrshire Bull Ayrshire Cow
ROSS-SHIRE.		
<i>Black Isle</i>	John MacLennan, Resolis James Cameron, Balnakyle Archibald Cameron, Artafallie	Cross Cow Clydesdale Gelding Leicester Tup
<i>Wester Ross</i>	D. G. Ross, Wester Lovat Murdo Bethune, Brae Peter Robertson, Achilty Duncan Davidson of Tulloch	Shorthorn Bull Clydesdale Stallion Blackfaced Tup Berkshire Sow
STIRLINGSHIRE.		
<i>Campsie, Strath- blane and Bal- dernock</i>	Robert Buchanan, Blairquhosh James Weir, Hole	Ayrshire Bull Clydesdale Mare
<i>Gargunnoch</i>	Robert Thomson, Burnbank Alexander M'Gregor, Easter Culmore James Graham of Auchencloch James Patrick, Queenszieburn	Shorthorn Bull Ayrshire Cow Ayrshire Cow Draught Mare



# PLOUGHING COMPETITIONS.

In 1879-80 the Society's Silver Medal was awarded at 167 Ploughing Competitions as follows:—

## ABERDEENSHIRE.

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION.	SILVER MEDAL AWARDED TO
1.	Aboyne.	Mills of Aboyne.	A. Webster, Newton of Drumduan.
2.	Belhelvie.	Middle Ardo.	James Walker, Smiddyburn.
3.	Braemar.	Fife Arms Farm.	Sam. Craigie, Fife Arms Farm.
4.	Buchan (Northern District).	Tophead.	Charles Kerr, Newmill.
5.	Buchan (Southern District).	Bruxia.	John Johnston, Pettymarcus.
6.	Corgarff.	Luib.	John Stuart, Boggach.
7.	Crathie.	Invergelder.	George Milne, Inver.
8.	Finzean.	Boghead.	William Gill, Balnabard.
9.	Leochel Cushnie.	Weszer Fowls.	William Gilbert, Shiel.
10.	Lumphanan.	Auchlossan.	William M'Gregor, Craigmyle.
11.	New Aberdour.	Killyquharn.	James Whyte, Bankhead.
12.	Newhills and Dyce.	Aahtown.	William Dawson, Sunnysbrae.
13.	New Machar.	Brokenwine.	John Thomson, Drumligair.
14.	North-East Aberdeenshire.	Sandhole.	Wm. Webster, Mains of Forrest.
15.	Skene and Midmar.	Garlogie.	Alexander Leiper, Souttarhill.
16.	Strichen.	Strichen Mains.	Andrew Quirie, Strichen Mains.

## ARGYLLSHIRE.

17.	Ardnamurchan.	Swordie.	Donald MacLachlan, Bransault.
18.	Dunoon.	Benmore.	Hugh M'Dougall, Ardenalate.
19.	Duror.	Ardseal.	John M'Coll, Greenfield.
20.	Islay, Jura and Colonsay.	Octavoulin.	Sam. M. M'Conechy, Dail.
21.	Kintyre.	Pennygowan.	Wm. M'Kerral, Brainerican.
22.	Lismore.	Salen.	Duncan Connell, Bailenagown.
23.	Lorn.	Pennyfuir.	Nell Brown, Dunbeg.
24.	Nether Lorn.	Dunmore.	John M'Innes, Ardmaddy.
25.	Salen.	Kintallen.	Donald Cameron, Baliscate.

## AYRSHIRE.

26.	Ayr and Alloway.	Burnton.	Hugh White, Carcluie.
27.	Coylton.	Millrcraig.	Robert Bryan, Pansy Cottage.
28.	Dairy.	Pitcon.	Wm. Smith, Craighead.
29.	Dairympie.	Knockjarder.	Jas. Blair, jun., Holmes.
30.	Fenwick.	Gainhill.	Robert Smith, Wylieland.
31.	Galston.	Courthorn.	James Paterson, Middlethirld.
32.	Kilmarnock.	Holmes.	James Paterson, Middlethirld.
33.	Kirkmichael.	Grimmet.	Quintin Young, Barnell.
34.	Monkton and Prestwick.	Hobeland.	William Atkinson, Newdykes.
35.	Monkwood and Minnishant.	Smithstone.	Hugh White, Carcluie.
36.	New Cumnock.	Rottenyard.	David Paterson, Lanemark.
37.	Ochiltree.	Dormiston.	Andrew Campbell, Langlands.
38.	Sorn and Dalgain.	Hillhead.	John Baird, Blindburn.
39.	Stewarton.	Castleton.	Robert Skille, Kirkwood.
40.	Straiton.	Straiton.	James Harvie, Knockgardner.
41.	Tarbolton.	Smithfield.	William Duncan, Montgomerie.

## BANFFSHIRE.

42.	Boharm.	Maryhill.	John Davidson, Soundmoor.
43.	Braes of Glenlivet.	Lettoch.	Alex. Stuart, Eakmulloch.
44.	Glenrinnes.	Wester Auchmore.	William Gordon, Balmerion.
45.	Keith.	Broadfield.	James Weir, Tarmore.
46.	Keith (1879).	Biras of Mulderie.	James Weir, Edintore.
47.	Spey, Avon and Fiddochside.	Keithmore.	James Moggach, Newton.
48.	Strathavon.	Anchichnie.	James Goutts, Lyne.

## BUTE AND ARRAN.

49.	Arran.	Shedog.	Daniel Gillies, Clachalg.
50.	Bute.	Largizean.	Duncan Morrison, Kerryeroy.

CAITHNESS-SHIRE.

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION.	SILVER MEDAL AWARDED TO
51.	Caithness.	Standstill.	Sinclair Leitch, Bullimore.

CLACKMANNANSHIRE.

52.	Clackmannanshire Union.	Hilton.	William Reid, Piperpool.
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CROMARTYSHIRE.

53.	Cromarty.	Mains of Cromarty.	James M'Phail, Rosefarm.
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DUMBARTONSHIRE.

54.	Kilmaronock and Bonhill.	Mains.	James Orr, Blairnla.
55.	Kirkintilloch.	Bedcow.	Hugh Cameron, Bedcow.

DUMFRIESSHIRE.

56.	Glencairn.	Ewanston.	James Welsh, Stewarton.
57.	Holywood.	Upper Cluden.	Robert Johnstone, Rosehill.
58.	Keir Parish.	Nether Keir.	William Halliday, Newhall.
59.	Kirkconnel.	Gateside.	John Gillespie, High Cairn.
60.	Penpont.	Floors.	Andrew Hughes, Tibbers.

EDINBURGHSHIRE.

61.	Glencross.	Fulford.	Robert Dickson, House of Muir.
62.	Lasswade.	Moat.	Thomas Peden, Boghall.

ELGINSHIRE.

63.	Edinkillie.	Dunphail.	William Allan, Tullyglens.
64.	Morayshire.	Muirton of Kinloss.	James Neish, Bands.
65.	Rafford.	Blackhillock.	Donald Urquhart, Cassieford.
66.	St Andrews Lhanbryd.	Wester Calcotts.	James Williamson, Lochhill.
67.	Urquhart.	Meft.	Alex. Sandieson, Innesmill.
68.	Western District of Elgin.	Inverlochty.	James Clark, Oldmills.

FIFESHIRE.

69.	Crossgates.	South Ballyeoman.	George Cousin, Salneshaw.
70.	Howe of Fifa.	Ballintagar.	D. Young, Ballintagar.
71.	Leslie.	Foremount Hills.	David Steele, Upper Stenton.

FORFARSHIRE.

72.	Bandirran and Gairdrum.	Bandirran.	James Slidders, Middleton.
73.	Dundee Mains & Stratthmartine.	Castle Mains.	Thomas Anderson, Magdalenes.
74.	Logie Pert.	Brae of Pert.	Thomas Pender, Cairn Bank.
75.	Kirriemuir.	Herdhill.	George Watson, Auchendorie.
76.	Tannadice and Oathlaw.	Noran Bank.	William Suttie, Coull.

HADDINGTONSHIRE.

77.	Lammermoor Pastoral.	Bothwell.	William Hill, Kidshielhaugh.
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INVERNESS-SHIRE.

78.	Abernethy.	Tomachroacher.	Alex. Ross, Manse.
79.	Badenoch and Rothiemurchus.	Nuide.	{ Donald Macqueen, Donne of Rothiemurchus.
80.	Duthil.	Gallovie.	Peter M'Donald, Easter Gallovie.
81.	Glen Urquhart.	Balmacaan.	Alex. Ross, Balmacaan.
82.	Laggan.	Drungask.	Robert Russel, Gaskbeg.
83.	Lochaber.	Muccomer.	Donald Cameron, Glenshellach.
84.	Nether Lochaber and Ardgour.	South Corran.	Donald Cameron, Glenshellach.
85.	Strathdearn.	Freeburn.	Wm. MacArthur, Streens.
86.	Stratherrick.	Gorthleck.	Donald Ross, Laidclune.
87.	Strathnairn.	Mains of Daviot.	Andrew Urquhart, Parks of Inshes.
88.	Strathnairn (Western District).	Milton of Farr.	Angus Mackintosh, Beachan.
89.	Strathspey.	Balmuichk.	Chas. Grant, Kinchurdy.

## KINCARDINESHIRE.

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION	SILVER MEDAL AWARDED TO
90.	Durris.	Upper Balfour.	William Greig, Ashentilly.
91.	Maryculter.	Westside.	Chas. Murray, West Tilburies.
92.	Portlithen.	Badentoy.	Alex. Yule, Mains of Findon.
93.	Rickarton, Urie and Fetteresso.	South Glenton.	William Moir, Blackburn.
94.	Strachan.	Ardlar.	Alex. Laing, Bowbutts.

## STEWARTRY OF KIRKCUDBRIGHT.

95.	Kirkpatrick-Durham.	Tarbrooch.	John Johnstone, Blackpark.
96.	New Abbey.	Overton.	Joseph Jardine, Ingleston.
97.	Penninghame, Minnigaff, &c.	Machermore.	Alex. M'Gowan, Balterson.
98.	Troqueer.	Nethertown.	David Young, Airds.

## LANARKSHIRE.

99.	Cadder.	Easter Lumloch.	Thomas Stewart, Balgray.
100.	Calderwaterhead.	Stane.	James Barr, Townhead.
101.	Carstairs.	Hangingshaw.	Daniel Carmichael, Newhouse.
102.	Crawford and Crawford John.	Nether Abington.	Edward French, Eastertown.
103.	East Kilbride.	Craighall.	John Walker, Lickprivity.
104.	Hamilton, Blantyre, &c.	Hillhouse.	John Sandilands, Woodhead.
105.	Old Monkland.	Bankhead.	John Sandilands, Woodhead.
106.	New Monkland.	Rochsolloch.	John Robb, Rochsolloch.

## LINLITHGOWSHIRE.

107.	Blackburn.	Seafeld.	William Greenhorn, Fala Mill.
108.	Kinnell.	Kinnell Mills.	William Haddow, Muirhouse.

## NAIRNSHIRE.

109.	Ardclack.	Dulzie.	Grigor MacGrigor, Tomloan.
110.	Nairnshire.	Balblair.	James Dean, Damhead.

## ORKNEY.

111.	Eglishay.	Mid Skall.	Wm. M. Mainland, Onziebust.
112.	Evie and Rendall.	Hall of Rendall.	Henry Mell, Bugar.
113.	Orkney.	Birstane.	William Sinclair, Dyke.
114.	Orphir.	Hall of Clestron.	W. Groundwater, Hall of Clestron.
115.	Rousay and Veira.	Banks.	Donald Allan, Furse.
116.	St Andrews.	Newark.	William Milne, Stembister.
117.	St Ola.	Weyland.	Thomas Wook, Quoystostane.
118.	Shapansay.	Oldinstone.	Laurence Irvine, Walmess.
119.	South Ronaldshay.	Hillside.	Charles Scott, Bankburn.
120.	Stronsay.	Bundatoon.	Robert Miller, Holland.
121.	West Mainland.	Gorn.	David Cowper, Isbister.
122.	Westray.	Clifton.	Thomas Driver, Gallowhill.

## PEEBLESSHIRE.

123.	Eddleston.	Hallowknowe.	Thomas Leadbetter, West Loch.
124.	West Linton and	} Hyndford.	{ Thomas Hutchison, Ingraston.
125.	Newlands.		{ James Aitken, Wester Deans.

## PERTHSHIRE.

126.	Ardoch.		John Duncan, Topfold.
127.	Blairdrummond, &c.	Baad.	William Graham, Baad.
128.	Breadalbane (Eastern Dist.)	Balmacnaghton.	Donald Waters, Dunskeig.
129.	Comrie and Upper Strathearn.	Cultabraggan.	William Jack, Braineroft.
130.	Culross.	Middle Grange.	James Wardlaw, Carnell.
131.	Drummond Castle.	Cultburn.	Robert Crow, North Drumdowie.
132.	Dunblane.	Kippenraik.	James Murray, Kippenross.
133.	Foss and Strathmummel.	Kynachan.	Donald M'Inroy, Borenich.
134.	Glenalmond.	Cairnies.	John Dewar, Downie.
135.	Glenquahen.	Altnie.	John M'Farlane, Wester Kinloch.
136.	Isla.	Bardmony.	James Sinclair, Morty.
137.	Kilmadock.	Munnieson.	Joseph Murray, Munnieson.
138.	Logiealmond and Lyndoch.	Drumharrow.	William Allan, Myreton.
139.	Mid. District of Athole, &c.	Meadows.	William Reekie, Guay.
140.	Monzievaird and Strowan.	Trowan.	William M'Kenzie, Balmuck.

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION	SILVER MEDAL AWARDED TO
141.	Moulin.	Achlat.	Duncan Stewart, Edradour.
142.	Port of Monteth.	Ballinlucater.	Duncan Dougall, Blaircessnock.
143.	Rannoch.	Drumchastle.	James M'Gregor, Tempar.
144.	St Mattins.	St Martins.	Stewart Donaldson, Boghall.
145.	Strathbraan.	Deanshaugh.	Donald Forbes, Deanshaugh.
146.	Strathearn (Central).	Lochend.	Danfel Seaton, Brickhall.
147.	Strathord.	Cottartown.	Donald Cameron, Ardgath.
148.	Struan, Glengarry, &c.	Blair Manse.	George Gow, Struan.
149.	Thornhill.	Lettieward.	Robert Ferguson, Goodiebank.
150.	Weem.	Castle Menzies.	John Small, Carse.

## RENFREWSHIRE.

151.	Cathcart and Eastwood.	Carrolside.	William Jackson, Carrolside.
152.	Erakine.	West Glenshinnoch.	John White, jun., Fulwood.
153.	Greenock, Gourock, &c.	Braeside.	William Broadfoot, Divert.
154.	Kilbarchan.	Locherside.	John Muir, Nether Johnstone.
155.	Renfrewshire.	Caudren.	Alex. Shearer, Mill-lands.

## ROSS-SHIRE.

156.	Easter Ross.	Arabella.	William Mann, Easter Ord.
157.	Edderton.	Balblair.	Alex. Ross, Balblair.

## ROXBURGHSHIRE.

158.	Lilliesleaf.	Firth.	Peter Henderson, Whitelee.
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## STIRLINGSHIRE.

159.	Arnprior.	Shewiebank.	Walter Brown, Auchentroig.
160.	Craigforth and Touch.	North Carsebony.	George Stewart, Kildean.
161.	Eastern Dist. of Stirlingshire.	Easter Carmuir.	Andrew Paterson, Roughlands.
162.	Strathendrick.	Mains.	Walter Brown, Auchentroig.

## SUTHERLANDSHIRE.

163.	Lairg.	Ballone.	Alex. Gray, Culmally.
164.	Skibo.	Pulrossie.	James Murray, Pulrossie.

## WIGTOWNSHIRE.

165.	Machars.	Sorbie.	William Melvin, Longhill.
166.	Old Luce.	Glentrone.	William M'Garvie, Culquharen.
167.	Whithorn and Glasserton.	Longhill.	James Brawls, Drumorrail.

167 Minor Silver Medals, £50, 2s.

## IV. COTTAGES AND GARDENS.

## 1. BEST KEPT COTTAGES AND GARDENS.

## ABERDEENSHIRE.

<i>Meithick</i> .....	William Hutcheon	Cottage	£1 and Minor Silver Medal	£1	6	0	
	Andrew Davidson	do.			0	10	0
	Alex. Mowat	do.	Minor Silver Medal		0	6	0
	George Moir	Garden	£1 and Minor Silver Medal	1	6	0	
	Alex. Cheyne	do.			0	10	0
	William Ligertwood	do.	Minor Silver Medal		0	6	0

## EDINBURGHSHIRE.

<i>Calder's Union</i> .....	Edward Blane	Cottage	1	0	0
	James Weir	Garden	1	0	0
	James B. Smith	do.	0	10	0
	E. Blane(1st Prize in 1879)	do. Minor Silver Medal	0	6	0

## FIFESHIRE.

<i>North of Fife</i> .....	Joseph Seath	Cottage	£1 and Minor Silver Medal	1	6	0	
	Henry Balislie	do.			0	10	0
	Henry Lister	do.	Minor Silver Medal		0	6	0
	James Maxwell	Garden	£1 and Minor Silver Medal	1	6	0	
	Thomas Duff	do.			0	10	0
	Robert Annan	do.	Minor Silver Medal		0	6	0

Carry forward, £11 4 0

				Brought forward,	£11	4	0
KINCARDINESHIRE.							
<i>Mearns</i> .....	George Douglas	Cottage	£1 and Minor Silver Medal	1	6	0	
	Mrs Alex. Bell	do.		0	10	0	
	Mrs John Paterson	do	Minor Silver Medal	0	6	0	
	Alex. Stott	Garden	£1 and Minor Silver Medal	1	6	0	
	George Douglas	do.		0	10	0	
	John Bruce	do.	Minor Silver Medal	0	6	0	
	John Silver	do.	Minor Silver Medal	0	6	0	
	(1st Prize in 1879)						
LINLITHGOWSHIRE.							
<i>Dalmeny &amp; Queensferry</i> ..	Mrs Miles	Cottage	£1 and Minor Silver Medal	1	6	0	
	Mrs Brown	do.		0	10	0	
	Mrs Cochrane	do.	Minor Silver Medal	0	6	0	
	Mrs Morris (1st Prize in 1879)	do.	Minor Silver Medal	0	6	0	
	David Robertson	Garden	£1 and Minor Silver Medal	1	6	0	
	Henry Reid	do.		0	10	0	
	Andrew Younger	do.	Minor Silver Medal	0	6	0	
PERTSHIRE.							
<i>Braco</i> .....	William Bayne	Cottage	£1 and Minor Silver Medal	1	6	0	
	David Monteath	do.		0	10	0	
	Janet King	do.	Minor Silver Medal	0	6	0	
	John Dewar	do.	Minor Silver Medal	0	6	0	
	(1st Prize in 1879)						
	John Dewar	Garden	£1 and Minor Silver Medal	1	6	0	
	Arch. Bennet	do.		0	10	0	
	Thos. Marshall	do.	Minor Silver Medal	0	6	0	
	Wm. Bayne	do.	Minor Silver Medal	0	6	0	
	(1st Prize in 1879)						
<i>Dunning</i> .....	James Liver	Cottage	£1 and Minor Silver Medal	1	6	0	
	Arch. M'Martin	do.		0	10	0	
	James Robertson	do.	Minor Silver Medal	0	6	0	
	James Robertson	Garden	£1 and Minor Silver Medal	1	6	0	
	Arch. M'Martin	do.		0	10	0	
	Thos. Callum	do.	Minor Silver Medal	0	6	0	
<i>Forgandenny</i> .....	Mrs Geo. Winders	Cottage	£1 and Minor Silver Medal	1	6	0	
	Mrs David Young	do.		0	10	0	
	Mrs Robt. Robson	do.	Minor Silver Medal	0	6	0	
	Mrs Jas. M'Culloch	do.	Minor Silver Medal	0	6	0	
	(1st Prize in 1879)						
	George Winders	Garden	£1 and Minor Silver Medal	1	6	0	
	David Young	do.		0	10	0	
	Robert Buchan	do.	Minor Silver Medal	0	6	0	
	Jas. M'Culloch	do.	Minor Silver Medal	0	6	0	
	(1st Prize in 1879)						
<i>Muthill</i> .....	Mrs John Bayne	Cottage	£1 and Minor Silver Medal	1	6	0	
	Mrs Jas. Graham	do.		0	10	0	
	Mrs Daniel Jolly	do.	Minor Silver Medal	0	6	0	
	John Keron	Garden	£1 and Minor Silver Medal	1	6	0	
	Andrew Gowans	do.		0	10	0	
	Miss Agnes Hutton	do.	Minor Silver Medal	0	6	0	
	Mrs John Lumsden	do.	Minor Silver Medal	0	6	0	
	(1st Prize in 1879)						
STIRLINGSHIRE.							
<i>Killearn</i> .....	Walter M'Feat	Cottage		1	0	0	
	George Cameron	do.		0	10	0	
	William Pearson	Garden	£1 and Minor Silver Medal	1	6	0	
	J. & W. M'Allan	do.		0	10	0	
	Mrs Robb	do.	Minor Silver Medal	0	6	0	
	James M'Nicol	do.	Minor Silver Medal	0	6	0	
	(1st Prize in 1879)						

Carry forward, £42 8 0

			Brought forward,	£42	8	0
WIGTOWNSHIRE.						
<i>Inch.</i>	..John Cumming	Cottage	£1 and Minor Silver Medal	1	6	0
	Charles Gibson	do.		0	10	
	Alex. M'Clymont	do.	Minor Silver Medal	0	6	
	David M'Haffie	Garden	£1 and Minor Silver Medal	1	6	
	William Nairne	do.		0	10	
	John Cumming	do.	Minor Silver Medal	0	6	
	Thos. Brown	do.	Minor Silver Medal	0	6	
(1st Prize in 1879)						

£46 18 0

## 2. MEDALS FOR COTTAGES AND GARDENS AND GARDEN PRODUCE.

Medium Silver Medals were awarded to the following:—

ABERDEENSHIRE.			
<i>Kinellar</i> .....	James Johnstone	Cottage	Garden
FIFESHIRE.			
<i>Dysart</i> .....	John Turpie	Flower Plot	
<i>Kirkcaldy</i> .....	James Walker	Garden	
	Robert Craig	Flower Plot	
INVERNESS-SHIRE.			
<i>Badenoch and Rothiemurchus</i> .....	Gregor M'Kenzie	Cottage	
	Alexander M'Pherson	Garden	
KINCARDINESHIRE.			
<i>Fordoun, Glenbervie and Arbuthnott</i> .....	John Ferguson	Vegetables	
	John Cadenhead	Flowers	
LANARKSHIRE.			
<i>Albert Gardens</i> .....	Alexander Muirhead	Best kept Plot	
	George D. Miller	Garden Produce	
<i>Carnwath</i> .....	William Smith	Garden	
	R. Alexander	Garden Produce	
<i>New Victoria Gardens</i> .....	Colin Ferguson	Best kept Plot	
	Charles M'Kenzie	Best kept Plot	
<i>Saracen Public Gardens</i> .....	John Black	Garden Produce	
	Robert Moodie	Best kept Plot	
NAIRNSHIRE.			
<i>Auldearn</i> .....	Mrs Falconer	Cottage	
	James Grant	Garden	
PERTHSHIRE.			
<i>Breadalbane, Weem, &amp;c.</i> .....	D. Watson	Best kept Garden	
	W. Stewart	Best Cropped Garden	
<i>Dunkeld and Birnam</i> .....	Charles Fletcher	Cottage Garden	
	Charles Fletcher	Garden Produce	
<i>Logiealmond and Glenalmond</i> .....	David Murray	Cottage	
	David Murray	Garden	

24 Medium Silver Medals, £12, 12s.

## V.—VETERINARY DEPARTMENT.

ANNUAL EXAMINATION—APRIL 1880.

E. J. A. C. Yorston, Manchester,	Practical Examination,	Med. Gold Medal,	£6	2
William Calvert, Middleham,	} Equal General Examination,	Med. Gold Medal,	6	
Jas. Wood Ingram, Manchester,		Med. Gold Medal,		

Carry forward, £18 6 0

## CLASS EXAMINATIONS—APRIL 1880.

## EDINBURGH VETERINARY COLLEGE.

			Brought forward.	£18 6 0
Joseph Donald, Cumberland,	Materia Medica,	Silver Medal,	0 16 0	
William Calvert, Middleham,	Anatomy,	Silver Medal,	0 16 0	
William Ryan, Limerick,	Botany,	Silver Medal,	0 16 0	
William Ryan, Limerick,	Physiology,	Silver Medal,	0 16 0	
William Ryan, Limerick,	Chemistry,	Silver Medal,	0 16 0	
Joseph Donald, Cumberland,	Veterinary Med. and Surgery,	Silver Medal,	0 16 0	
Alexander Grey, jun.,	Comparative Anatomy,	Silver Medal,	0 16 0	
Alexander M <sup>c</sup> Walter,	{ Veterinary Med. and Surgery } (Amateurs),	Silver Medal,	0 16 0	

## NEW VETERINARY COLLEGE, EDINBURGH.

George Edward Nash,	Horse Pathology,	Silver Medal,	0 16 0
Jas. W. Ingram, Manchester,	Horse Pathology,	Silver Medal,	0 16 0
Jas. W. Ingram, Manchester,	Cattle Pathology,	Silver Medal,	0 16 0
Thomas E. Horrocks,	Chemistry,	Silver Medal,	0 16 0
William Woods, Wigan,	Anatomy,	Silver Medal,	0 16 0
William Woods, Wigan,	Physiology,	Silver Medal,	0 16 0

## SUMMER SESSION, 1879.

W. Graham, Cummertrees,	Botany,	Silver Medal,	0 16 0
W. Woods, Wigan,	Materia Medica,	Silver Medal,	0 16 0

## SUMMER SESSION, 1880.

J. Finlayson, Gourrock,	Botany,	Silver Medal,	0 16 0
J. Carroll, Coolrus,	Materia Medica,	Silver Medal,	0 16 0

## GLASGOW VETERINARY COLLEGE.

R. Hughes, Llanarmon,	Horse Pathology,	Silver Medal,	0 16
James Wyper, Glasgow,	Cattle Pathology,	Silver Medal,	0 16
James Gosling, London,	Histology and Physiology,	Silver Medal,	0 16
James Gosling, London,	Anatomy,	Silver Medal,	0 16
J. F. Hayes, Portree,	Botany,	Silver Medal,	0 16
John Renfrew, Hurler,	Materia Medica,	Silver Medal,	0 16
John Renfrew, Hurler,	Chemistry,	Silver Medal,	0 16

£38 6 0

## VI.—AGRICULTURAL CLASS, EDINBURGH UNIVERSITY.

1. Andrew Chapman, Dumfriesshire,	£6 0 0
2. R. Colley Smith, Lanarkshire,	4 0 0
	£10 0 0

## ABSTRACT OF PREMIUMS.

1. ESSAYS AND REPORTS,	£225 0 6
2. KELSO SHOW, 1880,	2462 19 0
3. DISTRICT SHOWS:—	
Stock,	£829 18 6
Special Grants,	129 0 0
Local Societies—Medals in aid of Premiums given by (144),	76 12 0
Ploughing Associations—Medals to (167),	50 2 0
	884 12 6
4. COTTAGES AND GARDENS—Money Premiums and 48 Minor Silver Medals, £46, 18s.; 24 Medium Silver Medals, £12, 12s.	59 10 0
5. VETERINARY DEPARTMENT—Medals to Students,	38 6 0
6. AGRICULTURAL CHAIR, EDINBURGH UNIVERSITY—Prizes to Class,	10 0 0
	£3680 8 0

**STATE OF THE FUNDS**  
OF  
**THE HIGHLAND AND AGRICULTURAL SOCIETY**  
**OF SCOTLAND.**

At 30th NOVEMBER 1880.

**I. BONDS—**

Heritable Bonds,	£16,779	16	0
Debenture Bonds by Clyde Navigation Trustees,	3,450	0	0
Railway Debenture Bonds,	4,000	0	0
	<u>£24,229</u>	<u>16</u>	<u>0</u>

**II. DEBENTURE STOCK—**

£3,000 North British Railway Co., $4\frac{1}{2}$ per cent., at £108,	£3,240	0	0
£1,000 London and North-Western Railway Co., 4 per cent., at £114,	1,140	0	0
		<u>4,380</u>	<u>0 0</u>

**III. BANK STOCKS—**

£6,407, 7s. 8d. Royal Bank of Scotland, at £203, 5s.,	£13,023	0	1
2,218, 6s. 5d. Bank of England, at £277, 10s.,	6,155	16	10
2,000, 0s. 0d. British Linen Company Bank, at £272,	5,440	0	0
1,250, 0s. 0d. National Bank of Scotland, at £270,	3,375	0	0
1,062, 10s. 0d. Commercial Bank of Scotland, at £240,	2,550	0	0
1,091, 13s. 4d. Bank of Scotland, at £290,	3,165	16	8
		<u>£14,029</u>	<u>17s. 5d.</u>
		33,709	13 7

*Note.*—The original cost of these Bank Stocks was £22,317, 18s. 6d., showing a profit, at present prices, of £11,591, 15s. 1d.

**IV. TEN SHARES (£500) OF THE BRITISH FISHERY SOCIETY, valued at** 200 0 0

**V. ARREARS OF MEMBERS' SUBSCRIPTIONS, considered recoverable, .** 91 4 6

	£62,610	14	1
<b>DEDUCT BALANCE DUE ROYAL BANK ON CURRENT ACCOUNT, .</b>	538	4	0

<b>AMOUNT OF FUNDS, .</b>	<u>£62,072</u>	<u>10</u>	<u>1</u>
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**VI. BUILDING FUND—**

1. Estimated value of Buildings, No. 3 George IV. Bridge,	£3,100	0	0
2. Sums Invested in Debenture Bonds—			
North British Railway Company, .	£1,000	0	0
Clyde Navigation Trustees, .	1,000	0	0
		<u>2,000</u>	<u>0 0</u>
3. Sum lent on Heritable Bond, .		350	0 0
4. Deposit with Royal Bank, of date 11th November 1880,		115	7 7

<b>AMOUNT OF BUILDING FUND, .</b>	<u>£5,565</u>	<u>7</u>	<u>7</u>
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**VII. TWEEDDALE MEDAL FUND—**

Debenture Bond with Caledonian Railway Company, .	£500	0	0
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**VIII. FURNITURE—**

Estimated Value of Furniture, Paintings, Books, &c., .	£1,000	0	0
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W. S. WALKER, *Treasurer.*

ANTHONY MURRAY, *Convener of Finance Committee.*

MACKENZIE & SMITH, C.A., *Auditors.*

EDINBURGH, 5th January 1881.



# **ABSTRACT of the ACCOUNTS of the HIGHLAND and CHARGE.**

1. BALANCE due by Royal Bank of Scotland on Current Account at 30th November 1879,	£662. 2 0
2. BALANCE of Deposits with City of Glasgow Bank (in liquidation),	308 10 3
3. DEPOSIT with Royal Bank, of date 25th June 1879,	300 0 0
4. DEPOSIT with Royal Bank in name of Building Fund, of date 11th November 1879,	22 13 0
5. DEPOSIT with Royal Bank in name of Tweeddale Medal Fund, of date 20th November 1879,	500 0 0
6. ARREARS of Annual Subscriptions at 30th November 1879, as in last year's Abstract,	£83 7 6
Whereof due by Members who have now compounded for life, and there- by extinguished,	£8 11 0
Since ordered to be written off as irrecoverable,	36 14 6
	45 5 6
7. ARREARS from Perth Show, 1879,	38 0
8. INCOME FROM INVESTMENTS—	
(1.) Interest on Heritable Bonds—	
On £1,300 at $4\frac{1}{2}$ per cent., £58, 10s., less tax £1, 6s. 9d.,	£57 3 3
On £15,479, 16s. at 4 per cent., £619, 3s. 8d., less tax £14, 7s. 2d.,	604 16 6
£16,779, 16s.	£661 19 9
(2.) Interest on Debenture Bonds—	
On £7,450 at 4 per cent., £298, less tax £6, 16s. 7d.,	291 3 5
(3.) Interest on Debenture Stock—	
On £3000, at $4\frac{1}{2}$ per cent., £127, 10s., less tax £2, 18s. 5d.,	£124 11 7
On £1,000 at 4 per cent., £40, less tax 17s. 6d.,	39 2 6
	163 14 1
(4.) Interest on Deposit of £300 with Royal Bank to 4th November 1880,	8 3 0
(5.) Interest on Bank Account,	4 5 11
	£1,129 6 2
(6.) Dividends on Bank Stocks—	
On £6,407 7 8 Royal Bank of Scotland,	£608 14 0
2,218 6 5 Bank of England,	210 15 8
2,000 0 0 British Linen Co. Bank,	260 0 0
1,250 0 0 National Bank of Scotland,	162 10 0
1,062 10 0 Commercial Bank of Scotland,	122 3 9
1,091 13 4 Bank of Scotland,	141 18 4
	1,506 1 9
£14,029 17 5	
(7.) Dividend on £500 Stock of the British Fishery Society,	0 0 0
Note.—No dividend has been received on this Stock for the last seven years	
	2,635 7 11
9. INCOME from Building Fund—	
Interest on Heritable Bond, £350, at 4 per cent., £14, less tax 6s. 5d.,	13 13 7
Interest on Debenture Bonds, £2000 at 4 per cent., £80, less tax £1, 16s. 8d.,	78 3 4
Interest on Deposits with Royal Bank,	0 17 8
	92 14 7
Carry forward,	£4,554 13 9

# AGRICULTURAL SOCIETY of SCOTLAND for the YEAR 1879-80.

## DISCHARGE.

### 1. ESTABLISHMENT EXPENSES—

Salary to Secretary, . . . . .	£850	0	0
Salary to Clerk, £300; Second Clerk, £150, . . . . .	450	0	0
Messenger, £72; allowance to Widow of former Messenger, £26, 5s., . . . . .	98	5	0
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	£1,398	5	0
Feu-Duty, £28; Water Duty, £2, 3s. 4d.; Taxes, £32, 13s. 2d., . . . . .	62	16	6
Coals, £9, 1s. 5d.; Gas, £4, 15s. 5d.; Insurance, £3, 17s. 6d., . . . . .	17	14	4
Repairs and Furnishings, . . . . .	27	12	9

	£1,506	8	7
2. FEE to Auditors for 1878-79 Accounts, . . . . .	50	0	0
3. FEE to Practical Engineer, . . . . .	20	0	0

### 4. EDUCATION—

Grant to Professor of Agriculture, £150; Prizes, £10; Bursaries, £140; Fees to Examiners, and Expenses, £35, 1s. 6d., . . . . .	335	1	6
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### 5. CHEMICAL DEPARTMENT—

Salary to Chemist, . . . . .	£300	0	0
Repairs, &c., for Laboratory, . . . . .	19	14	1
Experimental Stations—			

#### Harelaw—

Rent, £30; Taxes, £1, 6s. 9d.; Superintendent's Allowance, £15, 15s., . . . . .	£47	1	9
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#### Pumpherston—

Rent, £13; Superintendent's Allowance, £15, 15s; Trenching Small Plots, £7, 10s., . . . . .	36	5	0
Manures, Zinc Tickets, &c., for Stations, &c., . . . . .	12	1	0
	<hr/>		
	95	7	9

	415	1	10
6. VETERINARY—Allowance to Professor Williams, £26, 5s.; Medals to Students, £38, 6s., . . . . .	64	11	0

7. TRANSACTIONS—Printing, Binding, and Delivering, £459, 5s. 6d., Essays and Reports, £202, 6s., . . . . .	661	11	6
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8. ORDINARY Printing and Lithographing, £40, 6s.; Advertising, £44, 2s. 9d.; Stationery and Books, £40, 10s. 2d.; Postages, £45; Bank Charges and Telegrams, £7, 14s. 2d., . . . . .	177	13	1
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9. SUBSCRIPTIONS TO PUBLIC SOCIETIES—Meteorological Society, £20; Society for Prevention of Cruelty to Animals, £5, . . . . .	25	0	0
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10. MISCELLANEOUS—Reporting General Meeting, £3, 3s.; Proof Slips for Do., £2, 2s.; Luncheon for Directors, £1, 15s. 6d.; Handsels, £1, 4s. 6d.; Re-striking Medals, 3s. 6d., . . . . .	8	8	6
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### 11. PREMIUMS—

Perth Show, 1879, . . . . .	£591	0	0
Kelso Show, 1880, . . . . .	2,084	9	0
District Competitions, 1876, . . . . .	8	0	0
District Competitions, 1879, £767, '2s. 6d.; Ploughing Competitions, 1879-80, £50, 2s.; Cottages and Gardens, 1879, £61, 4s. 6d., . . . . .	878	9	0
Vote to Edinburgh Christmas Club, 1879, . . . . .	50	0	0
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	3,606	18	0

Carry forward, . . . . .	£6,870	14	0
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# **ABSTRACT of the ACCOUNTS of the HIGHLAND**

	Charge brought forward, . . . . .	£4,554 13 9	
10. SUBSCRIPTIONS—			
	Annual Subscriptions due, . . . . .	£363 12 0	
	Life Subscriptions, . . . . .	806 11 6	
		<u>1,670</u>	3 6
11. CHEMICAL DEPARTMENT—			
	Subscriptions, . . . . .	£31 0 0	
	Experimental Stations—Proceeds from Straw sold at Harelaw, . . . . .	15 0 0	
		<u>46</u>	0 0
	<i>Note.</i> —The Account of proceeds and expenditure of Experimental Stations for the year 1880 not yet received.		
12. TRANSACTIONS—			
	Proceeds of Sales by Messrs Blackwood, . . . . .	8 13 8	
13. CAPITAL PAID UP—			
	Caledonian Railway Co. Debenture Bond, . . . . .	450 0 0	
14. BALANCE of Receipts from Kelso Show (exclusive of Premiums paid), <i>as shown in separate States,</i>		806	4 8
15. BALANCE due to Royal Bank of Scotland on current account, at 30th November 1880, . . . . .		538	4 0
	SUM OF CHARGE, . . . . .	<u>£8,073</u>	19 7

*Note.*—The income received on account of "Tweeddale Medal" Fund appears in the Kelso Show accounts.

EDINBURGH, 5th January 1881.

## **ABSTRACT OF ACCOUNTS—**

### **CHARGE.**

#### **1. LOCAL SUBSCRIPTIONS—**

1. *Berwickshire—Voluntary Assessment on Proprietors,	£300 0 0
2. Roxburghshire, do. do. . . . .	480 6 1
3. †Selkirkshire, do. do. . . . .	0 0 0
4. Peeblesshire, do. do. . . . .	104 18 5
5. Border Union Society, do. do. . . . .	100 0 0
6. Town of Kelso, . . . . .	55 0 0

£1040 4 6

#### **AMOUNT COLLECTED DURING SHOW—**

Drawn at Gates, . . . . .	£1360 16 0
Drawn at Horse Ring and Cattle Parade, . . . . .	165 16 6
Season Tickets, . . . . .	7 0 0
Catalogues and Awards sold, . . . . .	125 1 0
Drawn at Gentlemen's Room and Cloak Room, . . . . .	5 10 2
	<u>1664 3 8</u>
Carry forward, . . . . .	<u>£2,704 8 2</u>

\* Total Subscription not yet reported.

† Subscription not yet reported.

**and AGRICULTURAL SOCIETY of SCOTLAND—continued.**

Discharge brought forward,	£6,870	14	0
12. PAYMENTS in connection with former Shows—Perth 1879, Repairs to Monument Railing,	1	7	6
13. ARREARS of Subscriptions to be struck off as irrecoverable,	45	6	0
14. ARREARS of Subscriptions considered recoverable,	91	4	6
15. CAPITAL Sum lent on Debenture Bond,	450	0	0
16. DEBENTURE BOND, Caledonian Railway Company for "Tweeddale Medal,"	500	0	0
17. DEPOSIT with Royal Bank in name of Building Fund, of date 11th November 1880,	115	7	7
SUM OF DISCHARGE,	£8,073	19	7

W. S. WALKER, *Treasurer.*ANTHONY MURRAY, *Convener of Finance Committee.*MACKENZIE & SMITH, C.A., *Auditors.***KELSO SHOW, 1880.****DISCHARGE.****1. SHOW-YARD EXPENDITURE—**

Fitting up, £1887, 10s.; Rent of Park, £250; Two Turnstiles, £30; Railway Carriages, £4, 1s. 11d.; Painting Ticket Boards and Miscellaneous Expenses, £7, 8s. 8d.,	£2179	0	7
2. FORAGE AND BEDDING FOR STOCK,	198	3	5
3. POLICE FORCE,	46	8	0
4. TRAVELLING EXPENSES of Judges, &c.,	177	9	11
5. HOTEL and other Bills for Directors, Judges, Secretary, &c.,	258	16	0
6. TICKETS for President's Dinner for do.,	98	4	2
7. MUSIC in Show-Yard, &c.,	54	0	0
8. PRINTING Catalogues and Awards, and Lithographing Tickets, Badges, &c.,	177	10	0
9. ADVERTISING and Posting Bills,	49	5	3
10. ALLOWANCE to Local Secretaries,	20	0	0
11. ALLOWANCE to Practical Engineer,	18	18	0
12. ALLOWANCE to Local Veterinary Inspector,	10	0	0
Carry forward,	£3,287	15	4

## ABSTRACT OF ACCOUNTS—

Charge brought forward, .		£2,704	8	2
3. RENT OF STALLS—				
Stock, . . . . .	£729	0	0	
Implements, . . . . .	428	11	0	
Offices, . . . . .	32	10	0	
Attendants' Night Accommodation, . . . . .	12	14	0	
				1197 15 0
4. RENT OF REFRESHMENT BOOTHS, . . . . .				200 0 0
5. RENT OF PARK, . . . . .				140 0 0
6. FORFEITED DEPOSIT MONEY FOR RETURN OF HORSES, . . . . .				6 0 0
7. INTEREST FROM ROYAL BANK, . . . . .				6 3 9
8. INTEREST FROM TWEEDDALE MEDAL FUND, . . . . .				14 11 4
				£4268 18 3
BALANCE OF PAYMENTS, . . . . .				1278 4 4
				£5547 2 7
NOTE.—To the above Balance of . . . . .		£1278	4	4
There must be added the Pre- miums undrawn at 30th November 1880 amounting to		378	10	0
				£1656 14 4
Together, . . . . .				
Less amount of Subscriptions to be received from Berwickshire and Selkirkshire estimated at		200	0	0
				£1456 14 4
Making the probable loss, . . . . .				

ABSTRACT of the ACCOUNTS of the  
CHARGE.

1. FUNDS as at 30th November 1879—				
Debenture Bond by Caledonian Railway Company, . . . . .	£1,000	0	0	
Debenture Stock of the North British Railway Company, . . . . .	1,200	0	0	
Funded Debt of the Clyde Navigation Trust, £3000, pur- chased at . . . . .	2,970	0	0	
Stock of the Royal Bank, £305, purchased at . . . . .	671	0	0	
				£5,841 0 0
BALANCE in Bank at 30th November 1879, . . . . .				228 18 4
				£6,069 18 4
2. INCOME received—				
On £1000 Caledonian Railway Company Debenture Bond at 4 per cent., £40, less tax, 18s. 4d. . . . .	£39	1	8	
On £1200 North British Railway Company Debenture Stock at 4½ per cent., £51, less tax, £1, 8s. 5d., . . . . .	49	16	7	
On £3000 Funded Debt of Clyde Navigation Trust at 4 per cent., £120, less tax, £2, 15s., . . . . .	117	5	0	
On £305 Royal Bank Stock for year, . . . . .	28	19	6	
On Bank Account, . . . . .	1	18	9	
				237 1 6
SUM OF CHARGE, . . . . .				£6,306 19 10

**KELSO SHOW**—*continued.*

Discharge brought forward,	.	.	.	£3,287	15	4
13. ASSISTANTS, Porters, and Attendants,	.	.	.	125	16	0
14. ATTENDANTS at Turnstiles and Ticket Gates,	.	.	.	26	10	0
15. POSTAGES,	.	.	.	20	15	0
16. MISCELLANEOUS OUTLAYS—Cheque Books, Telegrams, &c.,	.	.	.	1	17	3
AMOUNT OF GENERAL EXPENSES,				£8462	13	7
17. PREMIUMS drawn at 30th November 1880,	.	.	.	2084	9	0

£5547 2 7

W. S. WALKER, *Treasurer.*

ANTHONY MURRAY, *Convener of Finance Committee.*

MACKENZIE & SMITH, C.A., *Auditors.*

EDINBURGH, 5th January 1881.

**ARGYLL NAVAL FUND for 1879-80.****DISCHARGE.**

1. ALLOWANCES to the five following Recipients—						
Norman Godfrey Macalister, sixth year,	.	.	.	£40	0	0
Charles Hope Dundas, second year,	.	.	.	40	0	0
Edward Walrond de Wells Bruce, first year,	.	.	.	40	0	0
Edward W. Elphinstone Wemyss, first year,	.	.	.	40	0	0
Louis Wentworth Chetwynd, first year,	.	.	.	40	0	0
				£200	0	0
2. FUNDS as at 30th November 1880—						
DERENTURE BOND by Caledonian Railway Company,	.	.	.	£1,000	0	0
DERENTURE STOCK of the North British Railway Company,	.	.	.	1,200	0	0
FUNDED DEBT of the Clyde Navigation Trust, £3000, purchased at	.	.	.	2,970	0	0
STOCK of the Royal Bank, £305, purchased at	.	.	.	671	0	0
				£5,841	0	0
BALANCE in Bank at 30th November 1880,				265	19	10
				6,106	19	10
SUM OF DISCHARGE,				£6,306	19	10

W. S. WALKER, *Treasurer.*

ANTHONY MURRAY, *Convener of Finance Committee.*

MACKENZIE & SMITH, C.A., *Auditors.*

EDINBURGH, 5th January 1881.

## VIEW OF THE INCOME AND EXPENDITURE

For the Year 1879-80.

## INCOME

ANNUAL SUBSCRIPTIONS received, . . . . .	£773	0	6
LIFE SUBSCRIPTIONS, . . . . .	806	11	6
	<hr/>		
	£1,579	12	0
INTEREST AND DIVIDENDS—			
Interest, . . . . .	£1,129	6	2
Dividends, . . . . .	1,506	1	9
	<hr/>		
	2,635	7	11
INCOME FROM BUILDING FUND, . . . . .	92	14	7
CHEMICAL DEPARTMENT, . . . . .	46	0	0
TRANSACTIONS—Sales by Messrs Blackwood, . . . . .	8	13	8
ARREARS from Perth Show, 1879, . . . . .	0	4	0
BALANCE OF RECEIPTS from Kelso Show 1880, available for Premiums amounting to £2,482, 19s., . . . . .	806	4	
	<hr/>		
SUM OF INCOME, . . . . .	£5,168	16	10

## EXPENDITURE.

## 1. ESTABLISHMENT—

Salaries and Allowances, . . . . .	£1,398	5	0
Fee Duty, Taxes, Coal, &c., . . . . .	108	3	7
	<hr/>		
	£1,506	8	7
FEE TO AUDITORS for 1878-79, . . . . .	50	0	0
FEE TO PRACTICAL ENGINEER, . . . . .	20	0	0
AGRICULTURAL EDUCATION (including Bursaries and Fees to Examiners), . . . . .	335	1	6
CHEMICAL DEPARTMENT, . . . . .	415	1	10
VETERINARY DEPARTMENT, . . . . .	64	11	0
TRANSACTIONS, . . . . .	661	11	6
ORDINARY Printing, Advertising, Stationery, Stamps, Bank Charges, and Telegrams, . . . . .	177	13	1
SUBSCRIPTION to Public Societies, . . . . .	25	0	0
MISCELLANEOUS, . . . . .	8	8	6
PREMIUMS—			
Perth Show, 1879, . . . . .	£591		
Kelso Show, 1880, . . . . .	2,084		
District Competitions, 1876, . . . . .	3		
District Competitions, 1879, . . . . .	767		
Ploughing Competitions, 1879-80, . . . . .	50		
Cottages and Gardens, 1879, . . . . .	61		
Vote to Edinburgh Christmas Club, 1879, . . . . .	50	0	0
	3,606	18	0
PAYMENT in connection with Perth Show, . . . . .	1	7	6
SUM OF EXPENDITURE, . . . . .	<hr/>		
	6,872	1	6
EXCESS OF EXPENDITURE, . . . . .	£1,708	4	8

# APPENDIX (B).

## PREMIUMS

OFFERED BY

### THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND IN 1881.

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## GENERAL NOTICE.

THE HIGHLAND SOCIETY was instituted in the year 1784, and incorporated by Royal Charter in 1787. Its operation was at first limited to matters connected with the improvement of the Highlands of Scotland; but the supervision of certain departments, proper to that part of the country, having been subsequently committed to special Boards of Management, several of the earlier objects contemplated by the Society were abandoned, while the progress of agriculture led to the adoption of others of a more general character. The exertions of the Society were thus early extended to the whole of Scotland, and have, for the greater part of a century, been directed to the promotion of the science and practice of agriculture in all its branches.

In accordance with this more enlarged sphere of action, the original title of the Society was altered, under a Royal Charter, in 1834, to THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

The leading purposes of the Institution are set forth in the following pages, where it will be found that Premiums are offered for Reports on almost every subject connected with the cultivation of the soil; the rearing and feeding of stock; the management of the dairy; the improvement of agricultural machinery and implements; the growth of timber; the extension of cottage accommodation; the application of chemical science; and the dissemination of veterinary information.

Among the more important measures which have been effected by the Society are—

1. Agricultural Meetings and General Shows of Stock, Implements, &c., held in the principal towns of Scotland, at which exhibitors from all parts of the United Kingdom are allowed to compete.
2. A system of District Shows instituted for the purpose of improving the breeds of Stock most suitable for different parts of the country, and of aiding and directing the efforts of Local Agricultural Associations.
3. The encouragement of Agricultural Education, under powers conferred by a supplementary Royal Charter, granted in 1856, and authorising "The COUNCIL of the HIGHLAND AND AGRICULTURAL SOCIETY ON EDUCATION" to grant Diplomas to Students of Agriculture; and by the establishment of Bursaries.
4. The establishment of Agricultural Stations for the purpose of promoting the application of science to agriculture, and the appointment of a chemist to superintend all experiments conducted at these Stations, and prepare a Report of the same to be published in the Transactions. Also to subsidise, under certain conditions, Local Analytical Associations.
5. The advancement of the Veterinary Art, by conferring Certificates on Students who have passed through a prescribed curriculum, and who are found, by public examination, qualified to practise.
6. The appointment of a Board of Examiners, and the granting of First and Second Class Certificates in Forestry.
7. The annual publication of the Transactions, which comprehend the Prize-Reports, and reports of experiments, also an abstract of the business at Board and General Meetings, and other communications.
8. The management of a fund left by John, 5th Duke of Argyll (the original President of the Society), to assist young natives of the Highlands who enter Her Majesty's Navy.

## CONSTITUTION AND MANAGEMENT.

The general business of THE HIGHLAND AND AGRICULTURAL SOCIETY is conducted under the sanction and control of a Royal Charter, which authorises the enactment of Bye-Laws. Business connected with Agricultural Education is conducted under the authority of a supplementary Royal Charter, also authorising the enactment of Bye-Laws.

The Office-Bearers consist of a President, Four Vice-Presidents, Thirty Ordinary and Twenty Extraordinary Directors, a Treasurer, an Honorary and an Acting Secretary, an Auditor, and other Officers.

The Directors meet on the first Wednesday of each month from November to June; seven being a quorum. The proceedings of the Directors are reported to General Meetings of the Society, held in January and in June or July.

With reference to motions at General Meetings, Bye-Law No. 10 provides—“That at General Meetings of the Society no motion or proposal (except of mere form or courtesy) shall be submitted or entertained for immediate decision unless notice thereof has been given a week previously to the Board of Directors, without prejudice, however, to the competency of making such motion or proposal to the effect of its being remitted to the Directors for consideration, and thereafter being disposed of at a future General Meeting.”

The Council on Education, under the Supplementary Charter, consists of Sixteen Members—Nine nominated by the Charter, and Seven elected by the Society. The Board of Examiners consists of Ten Members.

Candidates for admission to the Society must be proposed by a Member, and are elected at the half-yearly General Meetings in January and June or July. The ordinary subscription is £1, 3s. 6d. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from £12, 12s. to £7, 1s. Proprietors farming the whole of their own lands, whose assessment on the Valuation Roll does not exceed £500 per annum, and all Tenant-Farmers, Office-Bearers of Local Agricultural Associations, Resident Agricultural Factors, Land Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding £500 per annum, are admitted on a subscription of 10s. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from £5, 5s. to £3. According to the Charter, a Member who homologates his Election by paying his first subscription cannot retire until he has paid in annual subscriptions, or otherwise, an amount equivalent to a life composition. Members having candidates to propose are requested to state whether the candidate should be on the £1, 3s. 6d. or 10s. list.

Members of the Society receive the Transactions free on application to the Secretary, and are entitled to apply for District Premiums—to report Ploughing Matches for the Medal—to attend Shows free of charge, and to exhibit Stock at reduced rates.

Orders, payable at the Royal Bank of Scotland, Edinburgh, are issued by the Directors, in name of the persons in whose favour Premiums have been awarded.

All communications must be addressed to “FLITCHER NORTON MENZIES, Esq., Secretary of the Highland and Agricultural Society of Scotland, No. 3 GEORGE IV. BRIDGE, EDINBURGH.”

## ESTABLISHMENT FOR 1881.

### President.

HIS GRACE THE DUKE OF RICHMOND AND GORDON, K.G.,  
49 Belgrave Square, London.

### Vice-Presidents.

HIS GRACE THE DUKE OF MONTROSE, Buchanan Castle, Glasgow.  
The Right Hon. The EARL of MAR and KELLIE, Alloa Park, Alloa.  
The Right Hon. The EARL of DUNMORE, Dunmore Park, Stirling.  
CHAS. STIRLING HOME DRUMMOND MORAY of Abercairny, Crieff.

### Ordinary Directors.

CHARLES SMITH, Whittinghame, Prestonkirk.  
Major W. J. WAUCHOPE of Niddrie Marischal, Liberton.  
The Right Hon. Lord POLWARTH, Mertoun House, St Boswells.  
JOHN H. DICKSON of Corstorphine, Saughton Mains, Edinburgh.  
JAMES MAXTONE GRAHAM of Cultoquhey, Perth.  
JAMES HOPE, Duddingston, Edinburgh.  
JAMES KENNEDY of Sundaywell, Brandleys, Sanquhar.  
ANDREW RALSTON, Glamis House, Glamis.  
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Sir ALEXANDER MUIR MACKENZIE of Delvine, Bart., Dunkeld.  
WILLIAM DINGWALL, Ramornie, Ladybank.  
JOHN HENDRIE of Larbert, Stirlingshire.  
THOMAS ROSS, Bachilton, Perth.  
The Right Hon. Lord ARTHUR CECIL, Orchard Mains, Innerleithen.  
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JOHN SCOTT DUDGEON, Longnewton, St Boswells.  
JOHN FORMAN, Duncrahill, 51 Great King Street, Edinburgh.  
R. H. HARRIS, Earnhill, Forres.  
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REV. JOHN GILLESPIE, Mouswald Manse, Dumfries.  
Lieut.-Colonel HARE of Calder Hall, Philpston House, Winchburgh.  
GIDEON PORT of Knowesouth, Jedburgh.  
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# ESTABLISHMENT FOR 1881.

## Extraordinary Directors.

The Right Hon. Lord ELOHO, M.P., 23 St James' Place, London.  
 The Hon. HENRY CONSTABLE MAXWELL STUART of Traquair, Innerleithen.  
 Sir ROBERT HAY of Haystoun, Bart., Kingsmeadows, Peebles.  
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 Sir D. C. MARJORIBANKS of Guisachan, Bart., M.P., Brook House, Park Lane, W.  
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 COLIN J. MACKENZIE of Portmore, Eddleston.  
 JAMES SMITH, Chief Magistrate, Kelso.  
 ARCHIBALD CAMPBELL SWINTON of Kimmerghame, Dunse.  
 The Right Hon. Lord BALFOUR of BURLEIGH, Kennet, Alloa.  
 Vice-Admiral Sir WILLIAM EDMONSTONE of Duntreath, Bart., Strathblane.  
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 WILLIAM FORBES of Callendar, Falkirk.  
 Lieut.-Col. JOHN MURRAY of Polmaise, Polmaise Castle, Stirling.  
 ALEXANDER SMOLLETT of Bonhill, Cameron House, Alexandria, N.B.  
 WILLIAM SMYTHE of Methven, Methven Castle, Perth.

## Office-Officers.

WILLIAM STUART WALKER of Bowland, C.B., *Treasurer*.  
 Sir G. GRAHAM MONTGOMERY of Stanhope, Bart., *Honorary Secretary*.  
 FLETOHER NORTON MENZIES, *Secretary*.  
 Rev. JAMES GRANT, D.C.L., D.D., *Chaplain*.  
 ANDREW P. AITKEN, Sc.D., *Chemist*.  
 MACKENZIE & SMITH, C.A., *Auditors*.  
 MURRAY & FALCONER, W.S., *Law Agents*.  
 JOHN WILSON, University of Edinburgh, *Professor of Agriculture*.  
 JOHN HUTTON BALFOUR, M.D., F.R.S., *Professor of Botany*.  
 DAVID STEVENSON, F.R.S.E., M.I.C.E., *Consulting Engineer*.  
 JAMES D. PARK, *Practical Engineer*.  
 THOMAS DUNCAN, *Recorder and Clerk*.  
 JOHN MACDIARMID, *Second Clerk*.  
 GOURLAY STEELL, R.S.A., *Animal Portrait Painter*.  
 WILLIAM WILLIAMS, F.R.C.V.S., *Professor of Veterinary Surgery*.  
 THOMAS WALLEY, M.R.C.V.S., *Professor of Cattle Pathology*.  
 WILLIAM BLACKWOOD & SONS, *Publishers*.  
 NEILL & COMPANY, *Printers*.  
 G. WATERSTON & SONS, *Stationers*.  
 HAMILTON, CRICHTON, & Co., *Silversmiths*.  
 ALEXANDER KIRKWOOD & SON, *Medallists*.  
 JOHN WATHERSTON & SONS, *Inspectors of Works*.  
 WILLIAM SIMPSON, *Messenger*.

## Chairman of Committees.

- |   |   |
|---|---|
| 1. Argyll Naval Fund, . . .                         | Admiral MAITLAND DOUGALL of Scotsraig, Tayport. |
| 2. Chemical Department, . .                         | COLIN J. MACKENZIE of Portmore, Eddleston.      |
| 3. Cottages and Gardens, . .                        | HARRY MAXWELL INGLIS of Loganbank.              |
| 4. District Shows, . . .                            | A. CAMPBELL SWINTON of Kimmerghame, Dunse.      |
| 5. Finance, . . .                                   | ANTHONY MURRAY of Dolerie.                      |
| 6. General Shows, . . .                             | ANDREW GILLON of Wallhouse, Bathgate.           |
| 7. Hall and Chambers, . . .                         | JOHN ORD MACKENZIE of Dolphinton.               |
| 8. Law, . . .                                       | GRAHAM BINNY, W.S., 9 Hart Street, Edinburgh.   |
| 9. Machinery, . . .                                 | THOMAS MYLNE, Niddrie Mains, Liberton.          |
| 10. Ordnance Survey, . . .                          | ROBERT DUNDAS of Arniston, Gorebridge.          |
| 11. Publications and Pre-<br>miniums for Reports, } | ALEXANDER FORBES IRVINE of Drum.                |
| 12. Veterinary Department,                          | Major WAUCHOPE of Niddrie Marischal, Liberton.  |

## COMMITTEES FOR 1881.

## 1. ARGYLL NAVAL FUND.

Admiral MAITLAND DOUGALL of Scotsraig, R.N., Tayport, *Convener*.  
 GRAHAM BINNY, W.S., 9 Hart Street, Edinburgh.  
 HEW CRICHTON, S.S.C., 13 Nelson Street, Edinburgh.

## 2. CHEMICAL DEPARTMENT.

C. J. MACKENZIE of Portmore, Eddleston, *Convener*.  
 Professor DOUGLAS MACLAGAN, 28 Heriot Row, Edinburgh.  
 „ BALFOUR, Inverleith House, Edinburgh.  
 „ WILSON, University, Edinburgh.  
 JAMES MELVIN, Bonnington, Wilkieston, Mid-Lothian.  
 P. B. SWINTON, Holyn Bank, Gifford.  
 ROBERT HUTCHISON of Carlowrie, 29 Chester Street, Edinburgh.  
 JOHN MUNRO, Fairnington, Kelso.  
 ADAM SMITH, Stevenson Mains, Haddington.  
 THOMAS FERGUSON, Kinnochtry, Coupar-Angus.  
 THOMAS MYLNE, Niddrie Mains, Liberton.  
 WILLIAM RITCHIE of Middleton, Gorebridge.  
 CHARLES SMITH, Whittinghame, Prestonkirk.  
 JOHN SCOTT DUDGEON, Longnewton, St Boswells.  
 GEORGE R. GLENDINNING, Hatton Mains, Ratho.  
 ALEX. R. MELVIN, Bonnington, Wilkieston.  
 Rev. JOHN GILLESPIE, Mouswald Manse, Dumfries.  
 DAVID AINSLIE of Costerton, Blackshiels.  
 Dr ANDREW P. AITKEN, 3 George IV. Bridge, Edinburgh, *Chemist*.

## 3. COTTAGES AND GARDENS.

HARRY MAXWELL INGLIS of Loganbank, *Convener*.  
 The MARQUIS of HUNTLY, Aboyne Castle, Aberdeen.  
 JOHN ORD MACKENZIE of Dolphinton.  
 ARCHIBALD CAMPBELL SWINTON of Kimmerghame, Dunse.  
 C. J. MACKENZIE of Portmore, Eddleston.  
 Major WAUCHOPE of Niddrie Marischal, Liberton.

## 4. DISTRICT SHOWS.

ARCHIBALD CAMPBELL SWINTON of Kimmerghame, *Convener*.  
 Sir JAMES R. GIBSON-MAITLAND of Clifton Hall, Bart., Craigend, Stirling.  
 Sir JAMES H. GIBSON-CRAIG of Riccarton, Bart., Currie.  
 THOMAS MYLNE, Niddrie Mains, Liberton.  
 ALEXANDER YOUNG, Keir Mains, Dunblane.  
 ANDREW MITCHELL, Alloa.  
 ADAM SMITH, Stevenson Mains, Haddington.  
 JAMES HOPE, Duddingston, Edinburgh.  
 WILLIAM ELLIOTT LOCKHART of Borthwickbrae, Branksholme, Hawick.  
 THOMAS ELLIOT, Blackhaugh, Galashiels.  
 Lieut.-Col. HARE of Calder Hall, Philipston House, Winchburgh.  
 JAMES MAXTONE GRAHAM of Cultoquhey, Perth.

## 5. FINANCE.

ANTHONY MURRAY of Dolerie, *Convener*.  
 WILLIAM S. WALKER of Bowland, C.B., *Treasurer*.  
 Sir G. GRAHAM MONTGOMERY of Stanhope, Bart.  
 HEW CRICHTON, S.S.C., 13 Nelson Street, Edinburgh.  
 THOMAS A. HOG of Newliston, Kirkliston.  
 GRAHAM BINNY, W.S., 9 Hart Street, Edinburgh.  
 GEORGE AULDJO JAMIESON, C.A., 58 Melville Street, Edinburgh.

## COMMITTEES FOR 1881.

### 6. GENERAL SHOWS.

ANDREW GILLON of Wallhouse, Bathgate, *Convener*.  
Lord POLWARTH, Mertoun House, St Boswells.  
Lord ARTHUR CECIL, Orchard Mains, Innerleithen.  
Sir MICHAEL R. SHAW STEWART of Blackhall, Bart., Greenock.  
Sir JAMES H. GIBSON-CRAIG of Riccarton, Bart.  
DAVID STEVENSON, C.E., 84 George Street, Edinburgh.  
Professor WILSON, University, Edinburgh.  
THOMAS MYLNE, Niddrie Mains, Liberton.  
ALEXANDER YOUNG, Keir Mains, Dunblane.  
WILLIAM FORD, Fenton Barns, Drem.  
ANDREW MITCHELL, Alloa.  
CHARLES HOWATSON of Glenbuck, Lanark.  
ALEXANDER FORBES IRVINE of Drum.  
CHARLES SMITH, Whittinghame, Prestonkirk.  
DAVID R. WILLIAMSON of Lawers, Crieff.  
JOHN H. DICKSON of Corstorphine, Saughton Mains, Edinburgh.  
JOHN SCOTT DUDGEON, Longnewton, St Boswells.  
WALTER SCOTT, Glendronach, Huntly.  
Rev. JOHN GILLESPIE, Mouswald Manse, Dumfries.  
JAMES HOPE, Duddingston, Edinburgh.  
ANDREW RALSTON, Glamis House, Glamis.  
GIDEON POTT of Knowesouth, Jedburgh.  
C. J. MACKENZIE of Portmore, Eddleston.  
JAMES CUNNINGHAM, Tarbreoch, Dalbeattie.

### 7. HALL AND CHAMBERS.

JOHN ORD MACKENZIE of Dolphinton, *Convener*.  
Sir JAMES GARDINER BAIRD of Saughton Hall, Bart.  
ANTHONY MURRAY of Dolerie, 141 George Street, Edinburgh.  
GRAHAM BINNY, W.S., 9 Hart Street, Edinburgh.  
DAVID STEVENSON, C.E., 84 George Street, Edinburgh.  
WILLIAM S. WALKER of Bowland, C.B.

### 8. LAW.

GRAHAM BINNY, W.S., Edinburgh, *Convener*.  
JOHN ORD MACKENZIE of Dolphinton, W.S., Edinburgh.  
WILLIAM S. WALKER of Bowland, C.B.  
ANTHONY MURRAY of Dolerie, W.S., Edinburgh.  
HEW CRICHTON, S.S.C., 13 Nelson Street, Edinburgh.  
GEORGE AULDJO JAMIESON, C.A., 58 Melville Street, Edinburgh.  
THOMAS GRAHAM MURRAY, W.S., 11 Randolph Crescent, Edinburgh.

### 9. MACHINERY.

THOMAS MYLNE, Niddrie Mains, *Convener*.  
The Hon. GEORGE WALDEGRAVE LESLIE, Leslie House, Leslie.  
Lord ARTHUR CECIL, Orchard Mains, Innerleithen.  
Sir JAMES R. GIBSON-MAITLAND of Clifton Hall, Bart.  
DAVID STEVENSON, C.E., 84 George Street, Edinburgh.  
Professor WILSON, University, Edinburgh.  
JOHN MUNRO, Fairnington, Kelso.  
P. B. SWINTON, Holyn Bank, Gifford.  
C. J. MACKENZIE of Portmore, Eddleston.  
BRYDEN MONTEITH, Tower Mains, Liberton.  
G. W. MURRAY, Banff Foundry, Banff.  
JOHN SCOTT DUDGEON, Longnewton, St Boswells.  
JAMES ROSS, Newtonlees, Kelso.  
JOHN KEMP, Stirling.

JAMES A. R. MAIN, Clydesdale Iron Works, Possil Park, Glasgow.  
 JOHN MARSHALL, Maybole.  
 JOHN YOUNG, jun., Ayr.  
 JAMES D. PARK, Greenside Lane, Edinburgh, *Practical Engineer*.

#### 10. ORDNANCE SURVEY.

ROBERT DUNDAS of Arniston, *Convener*.  
 C. J. MACKENZIE of Portmore, Eddleston.  
 WILLIAM S. WALKER of Bowland, C.B.

#### 11. PUBLICATIONS AND PREMIUMS FOR REPORTS.

ALEXANDER FORBES IRVINE of Drum, *Convener*.  
 Sir JAMES R. GIBSON-MAITLAND of Clifton Hall, Bart.  
 WILLIAM S. WALKER of Bowland, C.B.  
 Professor BALFOUR, Inverleith House, Edinburgh.  
 „ WILSON, University, Edinburgh.  
 ROBERT SCOT SKIRVING, 29 Drummond Place, Edinburgh.  
 P. B. SWINTON, Holyn Bank, Gifford.  
 ROBERT HUTCHISON of Carlowrie, 29 Chester Street, Edinburgh.  
 THOMAS MYLNE, Niddrie Mains, Liberton.  
 DAVID STEVENSON, C.E., 84 George Street, Edinburgh.  
 Dr CLEGHORN of Stravithie, St Andrews.  
 WILLIAM ELLIOTT LOCKHART of Borthwickbras, Brannholme, Hawick.  
 ROBERT P. NEWTON of Castlandhill, Polmont Bank, Falkirk.  
 C. J. MACKENZIE of Portmore, Eddleston.  
 Rev. JOHN GILLESPIE, Mouswald Manse, Dumfries.  
 WILLIAM MACDONALD, Editor, *North British Agriculturist*, Edinburgh.

#### 12. VETERINARY DEPARTMENT.

Major WAUCHOPE of Niddrie Marischal, Liberton, *Convener*.  
 Lord ARTHUR CECIL, Orchard Mains, Innerleithen.  
 Sir ALEXANDER KINLOCH of Gilmerton, Bart., Drem.  
 ANDREW GILLON of Wallhouse, Bathgate.  
 WILLIAM S. WALKER of Bowland, C.B.  
 THOMAS MYLNE, Niddrie Mains, Liberton.  
 ADAM SMITH, Stevenson Mains, Haddington.  
 DAVID R. WILLIAMSON of Lawers, Crieff.  
 WILLIAM RITCHIE of Middleton, Gorebridge.  
 JAMES HOPE, Duddingston, Edinburgh.

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The President, Vice-Presidents, Treasurer, and Honorary Secretary, are members *ex officio* of all Committees.



## AGRICULTURAL EDUCATION.

### CERTIFICATES AND DIPLOMA IN AGRICULTURE.

#### COUNCIL ON EDUCATION.

By a Supplementary Charter under the Great Seal, granted in 1856, the Society is empowered to grant Diplomas.

#### *Members of Council named by Charter.*

The PRESIDENT OF THE HIGHLAND AND AGRICULTURAL SOCIETY—*President.*

The LORD JUSTICE-GENERAL—*Vice-President.*

The LORD ADVOCATE.

The DEAN OF FACULTY.

The PROFESSOR OF AGRICULTURE.

The PROFESSOR OF ANATOMY.

The PROFESSOR OF BOTANY.

The PROFESSOR OF CHEMISTRY.

The PROFESSOR OF NATURAL HISTORY.

#### *Members of Council nominated by Society.*

The DUKE OF BUCCLEUCH, K.G.

WILLIAM S. WALKER of Bowland, C.B.

JOHN WILSON, Wellnaga.

THOMAS MYLNE, Niddrie Mains.

ROBERT DUNDAS of Arniston.

JOHN MUNRO, Fairnington.

A. CAMPBELL SWINTON of Kimmerghame.

#### *Board of Examiners.*

1. *Science and Practice of Agriculture*.—Professor WILSON; JOHN WILSON, Wellnaga, Dunse; THOMAS MYLNE, Niddrie Mains, Liberton; and JOHN MUNRO, Fairnington, Kelso.
2. *Botany*.—Professor BALFOUR.
3. *Chemistry*.—Dr A. P. AITKEN.
4. *Natural History*.—Professor Sir C. WYVILLE THOMSON.
5. *Veterinary Science*.—Professor WILLIAMS.
6. *Field Engineering*.—DAVID STEVENSON, M. Inst. C.E.
7. *Book-keeping*.—JOHN TURNBULL SMITH, C.A.

#### *Standing Acting Committee.*

The LORD JUSTICE-GENERAL—*Convener.*

The PROFESSOR OF AGRICULTURE.

The PROFESSOR OF BOTANY

The PROFESSOR OF CHEMISTRY.

THOMAS MYLNE, Niddrie Mains.

JOHN MUNRO, Fairnington.

A. CAMPBELL SWINTON of Kimmerghame.

#### BYE-LAWS.

I. That, in terms of the Charter, the Society shall nominate seven members to act on the Council on Education.

II. That the Council shall appoint a Board of Examiners on the following subjects:—Science and Practice of Agriculture; Botany; Chemistry; Natural History; Veterinary Science; Field Engineering; and Book-keeping.

III. That the examinations shall be both written and oral, that the value of the answers shall be determined by numbers, and that the oral examinations shall be public.

IV. That there shall be three Examinations,\* to be styled respectively the "Second Class Certificate Examination," the "First Class Certificate Examination," and the "Diploma Examination."

V. That to pass the "Second Class Certificate Examination," a candidate must be acquainted with the science and practice of agriculture, elemen-

\* It has been resolved that, under ordinary circumstances, the Examinations shall be held annually in the end of March or beginning of April, candidates being required to lodge intimation before the 15th of March.

tary chemistry, field engineering, and book-keeping; and that a certificate in the following terms, bearing the corporate seal and arms of the Society, signed by the President or Vice-President of the Council on Education, the Examiners, and by the Secretary, shall be granted to candidates passing this examination:—

“These are to certify that on the A. B. was examined, and  
has been found to possess a knowledge of the science and practice of agriculture, elementary chemistry, field engineering, and book-keeping.”

VI. That to pass the “First Class Certificate Examination” a candidate must be acquainted with the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field engineering, and book-keeping; and that a certificate in the following terms, bearing the corporate seal and arms of the Society, signed by the President or Vice-President of the Council on Education, the Examiners, and by the Secretary, shall be granted to candidates passing this examination:—

“These are to certify that on the A. B. was examined, and  
has been found to possess a knowledge of the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field engineering, and book-keeping.”

VII. That to pass the “Diploma Examination” a candidate must possess a *thorough knowledge* of the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field engineering, and book-keeping; and that a diploma in the following terms, bearing the corporate seal and arms of the Society, and signed by the President or Vice-President of the Council on Education, the Examiners, and by the Secretary, shall be granted to candidates passing this examination:—

“These are to certify that, on the A. B. was examined,  
and has been found to be proficient in the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field engineering, and book-keeping.”

VIII. That each successful candidate for the Society’s Agricultural Diploma shall thereby become eligible to be elected a free life member of the Society.

IX. That the Society shall grant annually ten bursaries of £20 each; and five of £10 each, to be competed for by pupils of schools to be approved of by the Directors, which include or are willing to introduce the teaching of chemistry, and the following branches of natural science—physical geography, botany, and geology, into their curriculum.

X. That the £20 bursaries\* shall be tenable for one year at the University of Edinburgh, for the purpose of enabling the holders to take the classes necessary to qualify for the Society’s Certificate or Diploma; and the £10 bursaries to be tenable for the same period to enable the holders to receive another year’s preparation at the schools.

XI. That the bursaries shall be determined by examination held in Edinburgh by the Society’s Examiners.

XII. That a Standing Acting Committee of the Council on Agricultural Education shall be appointed by the Directors.

## SYLLABUS OF EXAMINATION FOR CERTIFICATES AND DIPLOMA.

### I.—SCIENCE AND PRACTICE OF AGRICULTURE.

1. Geological strata—surface geology—formation of soils—their classification—chemical and physical characters and composition—suitability for cultivation. 2. The principle of rotations—rotations suitable for different

\* The £20 bursaries are not due till the holder presents himself for examination for the Certificate or Diploma.

soils—systems of farming. 3. The composition of (a) manures—farmyard and artificial—period and mode of application. The composition of (b) feeding substances—their suitability for different classes of farm stock—considerations affecting their use. 4. “How crops grow”—our farm crops—their cultivation—diseases—insect injuries and remedies—their chemical composition. The formation and management of plantations. 5. The principles on which drainage, irrigation, and warping operations should be based and carried out. The application of lime—marl—clay, &c. 6. Meteorology, or the laws of climate as affecting plant life—the influence of light and heat on cultivation—of absorption and retention of heat and moisture—of porosity and capillarity in soils. 8. The breeding, rearing, feeding, and general treatment of farm stock—the different breeds of cattle and sheep—their characteristics—the districts where they are generally met with. 9. The machines and implements used in farming—their uses—and the principal points to be attended to in their construction. The “prime movers,” or sources of power used in agriculture—man—horse—wind—water—steam—their relative values and advantages. *Text-books*—Morton’s “Cyclopedia of Agriculture,” Blackie & Son; “Our Farm Crops,” Blackie & Son; “How Crops Grow,” Macmillan & Co.; Roscoe’s “Elementary Chemistry,” Macmillan & Co.; Lindley’s, Henfrey’s, or Balfour’s “Botany;” Page’s “Geological Text-Book,” Blackwood & Sons.

## II.—BOTANY.

1. Nutritive Organs of Plants—root, stem, leaves. Functions of roots. Various kinds of stems, with examples. Use of the stem. Structure of leaves. Different kinds of leaves. Arrangement and functions of leaves. 2. Reproductive Organs—Flower and its parts. Arrangements of the whorls of the flower—calyx, corolla, stamens, pistil. Ovule. Mature pistil or fruit. Pruning and grafting. Seed. Young plant or embryo. Sprouting of the seed, or germination. 3. General Principles of Classification—meaning of the terms Class, Order, Genus, Species. Illustrations of natural orders taken from plants used in agriculture, such as grain-crops, grasses, clovers, vetches, turnips, mangold-wurzel, pease, beans, &c. Practical Examination in fresh Specimens and Models; some of the latter may be seen in the Museum, at the Royal Botanic Garden, which is open daily to the public, free. *Text-book*—Balfour’s “Elements of Botany,” A. & C. Black, 1876; price 3s. 6d.

## III.—CHEMISTRY.

The general principles of chemical combination. The chemistry of the more commonly occurring elements, and their more important compounds. The chemical processes concerned in agriculture generally. The changes which take place in the germination, growth, and maturation of plants, in the weathering and manuring of soils, &c. The composition and chemical character of the common mineral manures. *Text-books*—Roscoe’s “Lessons in Elementary Chemistry,” Macmillan & Co., London; price 4s. 6d. Anderson’s “Elements of Agricultural Chemistry,” A. & C. Black, Edinburgh; price 6s. 6d. Johnson’s “How Crops Grow,” Macmillan & Co., London.

## IV.—NATURAL HISTORY.

### 1. ZOOLOGY.

1. The Primary Divisions of the Animal Kingdom, with examples of each. 2. The Vertebrate Kingdom. The peculiarities and functions of the alimentary canal, distinguishing the Ruminants. 3. The Orders—Hymenoptera, Diptera, and Coleoptera—with examples of insects injurious to farm crops, belonging to each of the Orders—the preservation of birds which prey upon these insects, drawing a distinction between those which are beneficial and those which are destructive to crops. *Text-book*—Nicholson’s “Introductory Text-Book of Zoology,” William Blackwood & Sons, Edinburgh and London.

## 2. GEOLOGY.

4. The various strata forming the earth's crust in their order of deposition. 5. Their influences on the surface soils of the country. 6. The meaning and application of Disintegration, Drift, Alluvium, Dip, Strike, Fault. Page's "Introductory Text-Book of Geology;" and Lyell's "Students' Elements of Geology."

## V.—VETERINARY SCIENCE.

1. Anatomy of the digestive organs of horse and ox, describing their structural differences. 2. The process of digestion in the above animals, and food most proper for each in quantity and quality. 3. The management of stock before, at, and after parturition. The time of utero-gestation in the domesticated animals. 4. The general principles to be followed in the treatment of very acute disease, before assistance of the veterinary surgeon can be procured.

## VI.—FIELD ENGINEERING.

1. Land-Surveying with the Chain. 2. Mensuration of Areas of Land, in imperial and Scotch acres, from a Chain Survey or from a Plan. 3. Levelling with the ordinary Levelling Instrument and Staff, and calculating levels and gradients. *Text-books*—Any one of the following:—Butler Williams' "Practical Geodesy," J. W. Parker, London; price 8s. 6d.; pages 1 to 19, 30 to 33, 56 to 59, 118 to 129. "Cassell on Land-Surveying," Cassell, Petter & Galpin, London; or "Bruff on Land-Surveying," Simpkin & Marshall, London; the parts which relate to chain-surveying and ordinary levelling only.

## VII.—BOOK-KEEPING.

1. Questions in practice and proportion. 2. Book-keeping—Describe books to be kept; give examples—taking of stock. *Text-book*—Stephen's "Practical System of Farm Book-keeping," Wm. Blackwood & Sons, Edinburgh; price 2s. 6d.

## EXAMINATION FOR BURSARIES.

Candidates are examined in the Elements of Botany, Chemistry, Physical Geography, and Geology. *Text-books*—Balfour's "Elements of Botany;" Roscoe's "Lessons in Elementary Chemistry;" Page's "Introductory Text-Book of Geology;" and Geikie's "Primer of Physical Geography;" Lyell's "Students' Elements of Geology."

It has been resolved that, under ordinary circumstances, the Examinations shall be held annually in the end of October, and Candidates must enter their names with the Secretary before the 10th of that month, and produce the necessary certificates from the teachers of the schools they have attended.

The bursaries are open to candidates not less than fourteen years of age.

## VETERINARY DEPARTMENT.

[*Note*.—An arrangement, as given at p. 15, having been made with the Royal College of Veterinary Surgeons that the holder of the Society's Veterinary Certificates are to be admitted Members of the Royal College, the Society is to cease holding examinations. But, not to disappoint those students who may have entered the teaching schools with the view of taking the Society's Certificate, the examinations will be continued till April 1881, in accordance with the former rules, it being clearly understood that unless fifteen students enter their names no examination will be held.]

In the year 1823 the Highland and Agricultural Society instituted lectures in Veterinary Science and Medicine, and arranged with the late Professor Dick to conduct the course.

In 1824 Examinations were commenced and Certificates granted, but only to Students who attended these lectures. Up to the present time 1160 certificates have been issued.

The Examinations are open to the Students of any Veterinary College established under Her Majesty's sign-manual.

In 1877 it was resolved that Students entering a Veterinary College after 1st January 1877, be subject to the following regulations:—

1. That there be two Examinations yearly, viz.—the First or Preliminary, and the Second or Final, both in April.

2. Students before entering their names for the First or Preliminary Examination, which embraces Botany, Chemistry, and Anatomy, must have attended two Winter Sessions and one Summer Session at a Veterinary College established under Her Majesty's sign-manual, and they must produce certificates from the Professor of each subject.

3. Students who have passed the First Examination, before entering their names for the Final Examination, which embraces Practice and Clinique, Physiology including Histology, Materia Medica, Cattle Pathology and Horse Pathology, must have attended three Winter Sessions and two Summer Sessions at a Veterinary College established under Her Majesty's sign-manual, and they must produce certificates from the Professor of each subject.

4. Students must pass the Practical and Clinical Examination before they can be examined on the other subjects enumerated in No. 3.

5. Students failing to pass either of the Examinations are required to attend a Veterinary College during one Summer and one Winter Session before being allowed to present themselves for Re-examination.

6. Members of the Medical Profession, or of any Colonial or Foreign Veterinary School or College, and others whose cases have been all specially considered and allowed by the Directors, may present themselves for Examination after attending one Winter Session at a Veterinary College in this country, and will receive the Certificate on passing one general Examination embracing all the subjects of the two Examinations.

In 1874 the Society resolved to vote annually Eight Silver Medals to each of the two Veterinary Colleges in Edinburgh, and to the one in Glasgow, for Class Competition; and two Medium Gold Medals, open to all the Students who come up to the Final Examination for the Society's veterinary certificate for best general and best practical Clinical Examinations.

The examinations are conducted by leading members of the Medical Faculty and of the Veterinary Profession; and a Certificate in the following terms, bearing the corporate seal and arms of the Society, and signed by the Examiners, is granted to those Students who pass the Final Examinations:—

#### HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

##### *Veterinary Examination.*

*At Edinburgh, the                      day of                      18*

These are to certify that                      has attended  
as a student during the period prescribed by the regulations established by  
the Directors of the Society, and, having been examined by us, we consider  
him duly qualified to practise the Veterinary Art.

Graduates holding the Certificate of the Society are eligible for appointment as Veterinary Surgeons in Her Majesty's service.

ARTICLES OF AGREEMENT made and entered into this 15th day of January 1879, between the Highland and Agricultural Society of Scotland, incorporated by Royal Charter or Letters Patent, bearing date the 17th day of May 1787, by the name and title of the Highland Society of Scotland, at Edinburgh; and of new incorporated by the name and style of the Highland and Agricultural Society of Scotland, by Charter or Letters Patent, granted the 18th day of June 1834 (and hereinafter called "The Society"), of the one part; and the Royal College of Veterinary Surgeons, incorporated by Royal Charter or Letters Patent, dated the 8th day of March 1844 (and hereinafter called "The College"), of the other part:

Whereas the Society have from 1823 instituted lectures on veterinary science and medicine, and appointed examiners to examine students therein, and until 1844 granted to such students certificates of proficiency: And whereas, in 1848, the Society reconstituted its Board of Examiners, and have since granted annually certificates of qualification: And whereas it was, amongst other things, provided by the said letters patent of the 8th day of March 1844, that the concerns of the College should be directed and managed by a Council, to be constituted as therein mentioned: And further, that the said Council should and might make any orders, rules, and bye-laws for fixing and determining, amongst other things, the times, places, and manner of examining students who should have been educated at the Royal Veterinary College of London or the Veterinary College of Edinburgh, or such other Veterinary Colleges as therein mentioned, and who might be desirous to become members of the College, and for regulating the nature and extent of such examinations, and for the appointment of persons to examine and determine upon the fitness and qualifications of such students, and for the admission or rejection of such students, as members of the College, and for fixing and determining the sum and sums of money to be paid by such students, either previous to their examination or upon their admission as members of the College or otherwise, and generally touching all other matters relating to or connected with the College, and the same orders, rules, and bye-laws from time to time to alter, suspend, or repeal, and to make new orders, rules, and bye-laws in their stead as the Council should think most proper or expedient, so as the same were not repugnant to the letters patent now in recital, or to the laws of the realm: And whereas, by a supplemental charter or royal letters patent, dated the 23d day of August 1876, it was, amongst other things, declared that, with certain exceptions therein mentioned and not material for the purposes of these presents, the College and the Council of the same should have and continue to have all such and the same jurisdiction, powers, and authorities for and with respect to the government of the College, and for, *inter alia*, the making, ordaining, confirming, annulling, or revoking orders, rules, and bye-laws, and transacting and ordaining all other matters and things whatsoever for the regulation, government, and advantage of the College, as the College and the Council thereof respectively had under or by virtue of the said hereinbefore-recited charter or letters patent, or in any other lawful manner: And whereas, in pursuance of the powers conferred upon the College or the Council thereof by the said letters patent respectively, certain bye-laws have been made with respect, among other things, to the examination of candidates for the diploma of the College, and such bye-laws are still in force: And whereas the following arrangement has been made and entered into between the College and the Society with a view to the admission of the holders of the certificates of the Society as members of the College, and also for the purpose of terminating the examinations heretofore held by the Society: Now these presents witness, and it is hereby agreed and declared, and in particular the College (so far as the stipulation and provisions hereinafter contained are to be performed or observed by them) do hereby, for themselves and their successors, covenant and agree with and to the Society

and their successors ; and the Society (so far as the stipulation and provisions hereinafter contained are to be performed and observed by them) do hereby covenant and agree with and to the College and their successors in the manner following, that is to say—

1. Every or any holder of a certificate granted by the Society, in manner aforesaid since 1848, shall, on application and on payment of such fees as are hereinafter specified, be admitted as a member of the College, and shall not be required to submit to any further examination previous to such admission.

2. Every holder of a certificate granted by the Society as aforesaid from 1848 to 1872, shall be admitted as a member of the College on payment of a registration fee of one guinea.

3. All candidates for such admission to whom such certificates as aforesaid shall have been granted since the year 1872, shall in like manner, without being required to submit to any further examination previous thereto, be entitled to such admission on payment of fees according to the following scale or table (that is to say)—

- (A) Every holder of a certificate granted during the year 1873, on payment of two guineas.
- (B) Every holder of a certificate granted during the year 1874, on payment of three guineas.
- (C) Every holder of a certificate granted during the year 1875, on payment of four guineas.
- (D) Every holder of a certificate granted during the year 1876, on payment of five guineas.
- (E) Every holder of a certificate granted during the year 1877, on payment of six guineas.
- (F) Every holder of a certificate granted during the year 1878, on payment of seven guineas.

4. All students now enrolled at any of the teaching schools connected with the Society to whom such certificates as aforesaid shall hereafter be granted consistently with the provisions of these presents, shall be admitted and enrolled as members of the College on payment of a fee of seven guineas.

5. The examinations heretofore held by or on behalf of the Society shall be discontinued as from the 1st day of January 1879, but this stipulation shall not preclude or prevent the Society from holding examinations according to its existing bye-laws or regulations for persons already admitted as students of the Society who may hereafter elect or claim to be examined by the examiners thereof in preference to submitting to examinations by or on behalf of the College.

6. The College and Society respectively shall alter, vary, and annul their existing orders, rules, and bye-laws if and so far as may be necessary to give full and complete effect to this agreement, and shall also, if required, apply for and use their best endeavours to obtain supplemental charters for the same or the like object.

7. If any doubt, difference, or dispute shall hereafter arise between the parties hereto or their successors touching these presents, or the construction hereof, or any clause or provision herein contained, or the rights, duties, or liabilities of either party in connection therewith, the matter in difference shall be referred to two arbitrators or their umpire, pursuant to and so as with regard to the mode and consequences of the reference ; and in all other respects to conform to the provisions in that behalf contained in the Common Law Procedure Act, 1854, or any then subsisting statutory modification thereof : In witness whereof, the Society and the College respectively have

hereunto caused their respective seals to be affixed the day and year first above written.

(Signed) A. GILLON, *Director*.  
 " ANTHONY MURRAY, *Director*.  
 " THOMAS MYLNE, *Director*.  
 " F. N. MENZIES, *Secretary*.

The Seal of  
 the Highland and  
 Agricultural Society  
 of Scotland.

(Signed) WM. HENRY COATES, *Secretary*.



#### BOARD OF EXAMINERS.

1. *Botany*.—Professor Balfour; Dr Cleghorn of Stravithie, St Andrews.
  2. *Chemistry*.—Dr W. Craig; A. Inglis M'Callum.
  3. *Anatomy*.—Dr Dyer; C. Cunningham, Slateford; A. Spreull, Dundee.
  4. *Practical and Clinical Examinations*.—Thomas A. Dollar, London; Finlay Dun, 2 Portland Place, London, W.; Tom Taylor, Manchester; John Lawson, Manchester; John Borthwick, Kirkliston; C. Cunningham, Slateford; Andrew Spreull, Dundee; Alexander Pottie, Paisley; W. D. Connochie, Selkirk.
  5. *Physiology and Histology*.—Dr Dyer; C. Cunningham, Slateford; Andrew Spreull, Dundee.
  6. *Materia Medica*.—Professor Balfour; Professor Douglas MacLagan; Finlay Dun; Dr Craig; A. I. M'Callum.
  7. *Diseases of Horses*.—John Borthwick, Kirkliston; John Lawson, Manchester; Tom Taylor, Manchester.
  8. *Diseases of Cattle, Sheep, Swine, and Dogs*.—Thomas A. Dollar, London; Alex. Pottie, Paisley; W. D. Connochie, Selkirk.
- President of the Board*—Dr Dyer, Edinburgh.  
*President of the Clinical Board*—Thomas A. Dollar, London.

### SYLLABUS OF VETERINARY EXAMINATIONS.

#### FIRST OR PRELIMINARY EXAMINATION.

##### BOTANY.

Structure and functions of nutritive and reproductive organs of plants. Natural families of medicinal and poisonous plants. Forage Plants. Diseases of agricultural plants caused by fungi. *Text-book*—Balfour's "Elements of Botany," A. & C. Black; 3s. 6d.

##### CHEMISTRY.

Elements of inorganic and organic chemistry; physiological chemistry; testing for commoner metals. *Text-book*—Roscoe's "Lessons in Elementary Chemistry," Macmillan & Co.; 4s. 6d.



## ANATOMY.

Anatomy of bones, muscles, blood-vessels, nerves, and viscera of horse, cow, and dog. Description of relative position of parts displayed by various dissections. Demonstration from actual specimens of muscles, tendons, blood-vessels, and nerves, of horse's limbs, larynx, eye, &c. Comparative anatomy of veterinary patients. The breeding, rearing, feeding, and humane treatment of the live stock of the farm—the different breeds—their characteristics—the districts where they are principally met with—and also the best and most humane system of horse-breaking. *Text-books*—Strangeways' "Anatomy," Maclachlan & Stewart; 17s. Chauveau's "Comparative Anatomy of the Domesticated Animals," by George Fleming, Veterinary Surgeon, Royal Engineers, Churchill & Sons; £1, 11s. 6d.

## FINAL EXAMINATION.

## THE PRACTICAL AND CLINICAL EXAMINATION

Include diagnosis and treatment, orally and in writing, of cases of lameness and diseases of horses, cattle, sheep, dogs, and swine. Examination of horses as to soundness. Surgical and other operations performed on veterinary patients. Examination, chiefly of morbid specimens, mostly conducted at the abattoirs.

## PHYSIOLOGY AND HISTOLOGY.

Minute anatomy of bone, blood, lung, and other tissues, of inflammatory products, and of tumours. Processes of digestion, circulation, respiration secretion, and excretion. Functions of nervous and reproductive systems. *Text-books*—"Lessons in Elementary Physiology," by Thomas H. Huxley LL.D. and F.R.S., Macmillan & Co.; 4s. 6d. Kirke's "Physiology. Bennet's "Physiology."

## MATERIA MEDICA.

Sources, mineral, botanical, or animal. Physical and chemical properties. Preparations, physiological action, therapeutic uses and doses of medicines. Poisoning in the lower animals, symptoms, post-mortem appearances, antidotes. Writing of prescriptions. *Text-books*—"Veterinary Medicines, their Actions and Uses," by Finlay Dun, Edmonston & Douglas, Edinburgh; 12s. 6d. "Veterinarian's Pocket Conspectus," by Thomas Walley, M.R.C.V.S., Lorimer and Gillies, Edinburgh.

## DISEASES OF HORSES.

Nature, symptoms, post-mortem appearances, causes, treatment, and prevention; accidents; construction and management of stables; shoeing. *Text-books*—"Manual of Veterinary Science," by the late William Dick, A. & C. Black. Green's "Morbid Anatomy." Williams' "Principles and Practice of Veterinary Surgery," Maclachlan & Stewart, Edinburgh; 30s.

## DISEASES OF CATTLE, SHEEP, SWINE, AND DOGS.

Nature, symptoms, post-mortem appearances; remedial and preventive treatment; dieting and general management of domestic animals. *Text-books*—Youatt on "Cattle, Sheep, Pigs, and Dogs." Blaine's "Principles of Veterinary Art." Gamgee's "Domesticated Animals in Health and Disease," Fullarton & Co., Edinburgh. Williams' "Principles and Practice of Veterinary Medicine;" 30s.

## FORESTRY DEPARTMENT.

The Society grants FIRST and SECOND CLASS CERTIFICATES in FORESTRY.

### BOARD OF EXAMINERS.

1. *Science of Forestry and Practical Management of Woods*.—Dr CLEGHORN, of Stravithie, St Andrews; JOHN MACGREGOR, Ladywell, Dunkeld; WILLIAM M'CORQUODALE, Scone Palace, Perth; J. GRANT THOMSON, Grantown, Strathspey.
2. *Elements of Botany*.—Professor BALFOUR.
3. *Nature and Properties of Soils, Drainage, and Effects of Climate*.—Professor WILSON.
4. *Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to Fencing, Drainage, Bridging, and Road-Making; Implements of Forestry*.—A. W. BELFRAGE, C.E.
5. *Book-keeping and Accounts*.—JOHN TURNBULL SMITH, C.A.

Candidates must possess—1st, A thorough acquaintance with the details of practical forestry. 2d, a general knowledge of the following branches of study, so far as these apply to Forestry:—The Outlines of Botany; the Nature and Properties of Soils, Drainage and Effects of Climate; Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to fencing, draining, bridging, and road-making; Implements of Forestry; Book-keeping and Accounts. The Examinations are open to Candidates of any age.

## SYLLABUS OF EXAMINATION.

### I.—SCIENCE OF FORESTRY AND PRACTICAL MANAGEMENT OF WOODS.

1. Formation and ripening of Wood. Predisposing causes of decay. 2. Restoration of Wood-lands:—(1.) Natural reproduction; (2.) Artificial planting. 3. General management of plantations. Cropping by rotation. Trees recommended for different situations. 4. Season and methods of pruning, thinning, and felling. 5. Circumstances unfavourable to the growth of trees. 6. Mechanical appliances for conveying and converting timber. Construction of saw-mills. 7. Qualities and uses of chief indigenous timbers. Processes of preserving timber. 8. Management of nurseries. Seed-sowing. 9. Collection of forest produce. 10. Manufacture of tar and charcoal. 11. Insects injurious to trees—preservation of birds which prey upon them, drawing a distinction between birds which are beneficial and those which are destructive to trees.

### II.—ELEMENTS OF BOTANY.

1. Nutritive Organs of plants.—Root, stem, leaves. Functions of roots. Various kinds of stems, with examples. Use of the stem. Structure of leaves. Different kinds of leaves. Arrangement and functions of leaves. 2. Reproductive Organs.—Flower and its parts. Arrangement of the whorls of the flower—calyx, corolla, stamens, pistil. Ovule. Mature pistil or fruit. Pruning and grafting. Seed. Young plant or embryo. Sprouting of the seed or germination. 3. General Principles of Classification.—Meaning of the terms Class, Order, Genus, Species. Illustrations taken from common forest trees and shrubs. Practical Examination on fresh specimens and models;

some of the latter may be seen in the Museum at the Royal Botanic Garden, which is open daily to the public free. Candidates may consult Professor Balfour's "Elements of Botany," published by A. & C. Black, Edinburgh, 1869. Price 3s. 6d.

### III.—NATURE AND PROPERTIES OF SOILS, DRAINAGE AND EFFECTS OF CLIMATE.

1. The different descriptions of soils, their classification, and suitability to growth of different descriptions of timber trees. 2. The composition and constituents of soils. The relations between the soil and trees growing on it. 3. The effects of drainage on soils and on climate. 4. The mode of drainage for plantations. 5. The influence of temperature, rainfall, aspect, shelter, and prevailing winds on tree life. 6. The methods of registering and recording observations, and the instruments used.

### IV.—LAND AND TIMBER MEASURING AND SURVEYING; MECHANICS AND CONSTRUCTION AS APPLIED TO FENCING, BRIDGING, AND ROAD-MAKING; IMPLEMENTS OF FORESTRY.

1. The use of the Level and Measuring Chain. Measuring and mapping surface areas. 2. The measurement of solid bodies—as timber, stacked bark, faggots, &c., earthwork. 3. The different modes of fencing and enclosing plantations; their relative advantages, durability, cost of construction, and repairs. 4. The setting out and formation of roads for temporary or permanent use. 5. The construction of bridges over streams and gullies; of gates or other entrances. 6. The different implements and tools used in planting, pruning, felling, barking, and working up timber trees, or preparing them for sale. Ewart's "Agricultural Assistant," Blackie & Son, Glasgow and Edinburgh, price 3s. 6d. Strachan's "Agricultural Tables," Oliver & Boyd, Edinburgh, price 2s. 6d.

### V.—BOOK-KEEPING AND ACCOUNTS.

1. Questions in practice and proportion. 2. Book-keeping—describe books to be kept; give examples. Taking of stock.

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## CHEMICAL DEPARTMENT.

*Chemist to the Society*—Dr A. P. AITKEN, Chemical Laboratory,  
8 Clyde Street, Edinburgh.

The object of the Chemical Department is to carry on the Experiments at the Society's Agricultural Stations, and to consider all matters coming before the Society's notice in connection with the chemistry of agriculture.

The practical chemical work of the Society is under the charge of its Chemist, whose duties are—

1. To superintend the experiments being carried on at the experimental stations of the Society, to make all necessary analyses and investigations in connection therewith, and to prepare an annual report of these for publication in the *Transactions*.
2. To perform the requisite analyses in connection with such other experiments as are conducted under the sanction and direction of the Chemical Committee, and report on the same if desired.
3. To prepare a summary of all analyses for which the Society has contributed payment, and full details of such as appear to the Chemical Committee worthy of notice for publication in the *Transactions*.
4. To attend all meetings of the Chemical Committee of the Society.
5. To have a laboratory in Edinburgh, where he may be consulted by members of the Society, and to be in attendance there every Wednesday for that purpose.
6. To maintain a sufficient staff of assistants, one of whom at least is specially engaged in, and acquainted with, both the chemical and experimental work of the Society.
7. To prepare annually for publication in the Society's *Transactions* a report on the more important investigations and experiments being conducted in this country and elsewhere on the application of chemistry to agriculture.
8. To deliver lectures at such places and on such subjects connected with the chemistry of agriculture as are approved of by the Chemical Committee, and for which the chemist is permitted to receive remuneration from those applying for his services.

The chemist and his assistants are paid their travelling expenses when on the Society's work.

He receives a fee of £1, 1s. for each analysis made by him when employed as referee in connection with Local Associations.

He is entitled to charge for analyses made for members of the Society according to the following scale of fees :—

Manures, . . . . .	£1 0 0
Feeding Stuffs, . . . . .	1 0 0
Water, Sanitary Analysis, . . . . .	1 0 0
„ Full Analysis, . . . . .	5 0 0
Soil, Analytical Examination and Recommendation of Manures, . . . . .	1 10 0
„ Full Analysis, . . . . .	5 0 0
Vegetable Products, such as Hay, Turnips, Grain, &c., . . . . .	1 10 0
Partial Analysis, each constituent, . . . . .	0 10 0
Testing for Gross Adulteration, . . . . .	0 5 0
Advice, . . . . .	0 5 0

## INSTRUCTIONS FOR SELECTING SAMPLES FOR ANALYSIS.

## MANURES.

Four or more bags are to be selected for sampling. Each bag is to be emptied out separately on a clean floor, worked through with the spade, and one spadeful taken out and set aside. The four or more spadefuls thus set aside are to be mixed together until a uniform mixture is obtained. Of this mixture one spadeful is to be taken, spread on paper, and still more thoroughly mixed, any lumps which it may contain being broken down with the hand. Of this mixture two samples of about a pound each shall be taken by the purchaser or his agent, in the presence of the seller or his agent or two witnesses, and these samples shall be taken as quickly as possible and put into bottles or tin cases to prevent loss of moisture, and having been labelled, shall be sealed by the samplers—one sample to be retained by the association, and the other to be sent to the chemist for analysis.

## FEEDING STUFFS.

Samples of feeding compounds are to be taken in a similar manner.

Samples of cake are to be taken by selecting three cakes, breaking each across the middle, and from the broken part breaking a small segment across the entire breadth of the cake. The three pieces thus obtained shall be wrapped up and sealed by the samplers, and sent for analysis as in the case of manures, and three duplicate pieces similarly sealed shall be retained by the association.

## SOILS.

Dig a little trench about two feet deep, exposing the soil and subsoil. Cut from the side of this trench a perpendicular section of the soil down to the top of the subsoil, and about four inches wide. Extract it carefully, and do not allow the subsoil to mix with it. A similar section of subsoil immediately below this sample should be taken and preserved separately. Five or six similarly drawn samples should be taken from different parts of the field, and kept separate while being sent to the chemist, that he may examine them individually before mixing in the laboratory.

## VEGETABLE PRODUCTS.

*Turnips, &c.*, 20 to 30 carefully selected as fair average bulbs.

*Hay and straw* must be sampled from a thin section cut across the whole stack, and carefully mixed about; about 20 lbs. weight is required for analysis.

*Grain* should be sampled like feeding stuffs.

## WATERS.

The bottles or jars in which samples of water are sent should be thoroughly cleaned. This is done by first rinsing them with water, then with a little oil of vitriol. After pouring this out the bottle should be rinsed six times with water, filled, corked with a new washed cork, sealed, and sent *without delay*. (Chemically clean bottles may be sent from the laboratory.)

Well water may be collected at any time, but it should be allowed to run for some time before the sample is taken.

Spring or stream water should be collected when the weather is dry.

In the analysis of a mineral water it may sometimes be desirable to determine the amount of gases held in solution, in which case certain precautions must be observed which require the presence of the chemist at the spring.

## LOCAL ANALYTICAL ASSOCIATIONS.

At the General Meeting of the Society held on 19th January 1881, the following resolutions were passed :—

I. With the view of encouraging, as well as regulating the conduct of, Local Analytical Associations, the Society shall contribute from its funds towards their expenses a sum for the present not exceeding £250 annually.

II. That the amount of such contribution shall be to each association at the rate of 5s. for each full analysis, and 2s. 6d. for each partial analysis of manures or feeding stuffs effected, or such proportion thereof as the above annual contribution may permit of, the pecuniary assistance thus contemplated to be subject to the following conditions being complied with to the satisfaction of the Chemical Committee :—

1. That the rules of the association be submitted to and approved of by the Chemical Committee.

2. That it be a condition of participating in the grant that the association make analyses for members of the Highland and Agricultural Society being farmers and not members of the local association, charging them the cost price to the association, less the amount recovered from the Society.

3. That the association is managed by a committee of practical farmers owning or occupying land in the district.

4. That the analyst employed is of acknowledged standing.

5. That the benefits of the grant shall apply only to analyses made for farmers, and that they subscribe towards the expenses of the association, subject to the exception in No. 2.

6. That each analysis represents at least 2 tons of bulk actually purchased under guarantee, or at a specified price per unit of valuable ingredients, and delivered to one or more members, and that the analysis has been made from a sample drawn in accordance with the published instructions of the Society, and that a sealed duplicate sample has been retained.

7. That with each analysis is furnished the names and addresses of the seller and of the buyer or buyers, the guarantee given, the cash or credit price at which bought, the place of delivery, and the result as determined by the analyst of the association.

8. That in the case of any manufactured manure reported upon, the seller shall be obliged to supply members of the association with a further quantity at the same price and terms, provided the order is given not later than one month after the parcel reported upon has been delivered and the quantity in all does not exceed 20 tons.

9. That all analyses be reported according to forms to be furnished by the Highland and Agricultural Society, and valuations of manures, if any are made, to be calculated on a uniform standard to be issued periodically by the Society, and at least once a year.

III. That a summary of all analyses for which the Society has contributed payment, and full details of such as shall appear to the Chemical Committee worthy of notice, shall be published each year in the *Transactions*. But before such publication is made, in the case of all which show an inferiority in the whole valuable constituents of 8 per cent. or upwards between the guarantee given and the analysis obtained, there may be at the option of the seller, to whom due notice will be given, a further analysis made by an independent chemist to be chosen by the Society.

The report of each analysis for which a grant is claimed must be sent to the Secretary of the Highland and Agricultural Society on or before the 1st November of each year, written on a schedule (copies of which will be supplied by the Society) containing the following particulars :—

Name and Address of Seller and of Buyer.

Kind of Manure or Feeding Stuff and quantity purchased.

Price per ton, or prices per unit of ingredients.

Guaranteed and found analyses, and date when sample was drawn.

The actual reports of the association's analyst must accompany the schedules as vouchers, and these will be returned.

In the case of all analyses which show an inferiority in the whole valuable constituents of 8 per cent. or upwards, it is necessary that no time be lost in communicating with the seller, in order that no deterioration may take place in the reserved sample, which, along with any explanation received from the seller, shall be forthwith forwarded to the Secretary of the Highland and Agricultural Society.

The following are the forms in which analyses must be reported :—

### I. REPORTS OF ANALYSES OF *MANURES*.

*(On the one side are the analytical details, and on the other the valuable constituents, which alone are considered in estimating the value of manure.*

#### 1. Form of Analysis for SUPERPHOSPHATES, DISSOLVED BONES, and the like.

	<i>Valuable constituents.</i>
Phosphoric Acid, in a soluble state, . . . . .	.....   = Phosphate of Lime, } dissolved, .
Do., in an insoluble state, .	.....   = Do. undissolved,
Lime, Sulphuric Acid, &c., .	
Sand and insoluble matter,	
Nitrogen, . . . . .	.....   = Ammonia, .

#### 2. Form of Analysis for BONES, BONE MEAL, FISH GUANO, and the like.

	<i>Valuable constituents.</i>
Phosphoric Acid, . . . . .	= Phosphate of Lime, . . . . .
Lime Alkalies, &c., . . . . .	
Organic matter, . . . . .	Yielding Ammonia, . . . . .
Moisture, . . . . .	
Sand and insoluble matter,	

#### 3. Form of Analysis for MIXED MANURES, PERUVIAN and ICHABOE GUANOS, and the like.

	<i>Valuable constituents.</i>
Phosphoric Acid, in a soluble state, . . . . .	= Phosphate of Lime, } dissolved, . . . . .
Do., in an insoluble state, .	= Do., undissolved, .
Lime, . . . . .	
Alkalies, &c., . . . . .	{ Potash, . . . . . = Sulphate of Potash,
Ammonia Salts, . . . . .	{ Nitrates = Ammonia
Organic matter, . . . . .	Yielding Ammonia
Moisture, . . . . .	Yielding Ammonia
Sand and insoluble matter,	

II. REPORTS OF ANALYSES OF *FEEDING STUFFS*.

<i>Valuable constituents</i>	{	Albuminoid compounds, . . . . .	.....
		Oil, . . . . .	.....
		Mucilage, Sugar, Starch, &c., . . . . .	.....
		Woody Fibre, . . . . .	.....
		Moisture, . . . . .	.....
		Ash, . . . . .	.....
		Nitrogen, . . . . .	.....

## INTERPRETATION OF ANALYSES.

The following notes will be found useful in enabling those unacquainted with chemistry to interpret analytical reports:—

## I. MANURES.

The three items of greatest importance in manures are phosphoric acid, nitrogen, and potash.

(1.) PHOSPHORIC ACID is present in manures as such, and also as phosphates of lime, magnesia, iron, and alumina.

*Phosphate of Lime* is most important, and exists in two states, insoluble and soluble.

*Insoluble—*

Insoluble phosphate of lime, called also	{	contains about 46 % phosphoric acid.
Tricalcic phosphate, and		
Tribasic phosphate of lime.		

*Soluble—*

Soluble phosphate of lime, called also	{	contains about 61 % phosphoric acid.
Acid phosphate of lime, and <i>erroneously</i> Monobasic phosphate of lime,		
Some analysts prefer to state the soluble phosphate as		

Biphosphate of Lime, called also	{	contains about 72 % phosphoric acid.
Monobasic phosphate,		

The soluble phosphates are usually stated as equivalent to so much tricalcic phosphate.

Soluble phosphate, multiplied by $1\frac{1}{2}$	{	gives the equivalent of tricalcic phosphate nearly.
Biphosphate, " " $1\frac{1}{2}$		

The words *soluble phosphate* are frequently used in place of *phosphate of lime rendered soluble*.

Phosphate of magnesia occurs in small quantity in bones, &c., and is usually reckoned as tricalcic phosphate.

Phosphates of iron and alumina when occurring in *small quantity* are usually reckoned as tricalcic phosphate.

*N.B.*—To save ambiguity all phosphates should be described as containing so much anhydrous phosphoric acid ( $P_2O_5$ ) in a soluble or in an insoluble state.

This amount multiplied by 2.183 would then give the equivalent of tricalcic phosphate.

(2.) NITROGEN occurs in manures mostly in three forms. Ammonia salts, nitrates, and albuminoid matter.

Ammonia sulphate (pure), contains  $25\frac{3}{4}$  % ammonia.

Ammonia chloride (pure), "  $31\frac{1}{4}$  " "

Nitrate of soda (pure), contains 16.47 % nitrogen, equal to 20 % ammonia.



Albuminoid matter contains about 16 % nitrogen, equal to about 19 % ammonia, which sooner or later becomes available as plant food.

- (3.) POTASH is found in small amount in most manures, and should be reckoned as anhydrous potash ( $K_2O$ ).

Sulphate of potash (pure), contains potassium = 50 % anhydrous potash.

Muriate of potash (pure), contains potassium = fully 63 % anhydrous potash.

## II. FEEDING STUFFS.

These are chiefly concentrated forms of food whose value depends on the amounts they contain of albuminoids, oil, and carbohydrates.

*Albuminoids* are compounds containing nitrogen, and more or less resemble dry flesh in their composition. They are sometimes called *flesh formers*. They are the most valuable constituents of feeding stuffs. The percentage of nitrogen contained in a cake multiplied by  $6\frac{1}{2}$  gives the percentage of albuminoids.

*Carbohydrates* are compounds such as sugar, starch, gum, and cellulose.

*Woody fibre* is the name given to that part of the cellulose, which is insoluble when boiled in weak solutions (5%) of acids and alkalies, and is therefore considered indigestible.

Good linseed, cotton, and rape cakes should contain from 4% to 5 % nitrogen, about 10 % oil, and about 6 % ash.

## USEFUL FACTORS.

Amount of	Multiplied by	Gives corresponding amount of
Nitrogen . . . .	1.214	Ammonia.
" . . . .	6.3	Albuminoid matter.
Ammonia . . . .	3.882	Sulphate of Ammonia.
" . . . .	3.147	Muriate of Ammonia.
" . . . .	3.706	Nitric Acid.
" . . . .	5.0	Nitrate of Soda.
Potash (anhydrous) . .	1.85	Sulphate of Potash.
" . . . .	1.585	Muriate of Potash.
Phosphoric Acid (anhydrous)	2.183	*Phosphate of Lime
" "	1.4	Biphosphate.
" "	1.648	Soluble Phosphate
Soluble Phosphate . . .	1.325	(monocalcic tribasic).
Biphosphate . . . .	1.566	Phosphate of Lime
Lime . . . .	1.845	Phosphate of Lime
" . . . .	1.786	Carbonate of Lime.

By phosphate of lime is meant tricalcic phosphate ( $Ca_3 P_2 O_8$ ).

## P R E M I U M S.

### GENERAL REGULATIONS FOR COMPETITORS.

All reports must be legibly written, and on one side of the paper only; they must specify the number and subject of the Premium for which they are in competition; they must bear a distinguishing motto, and be accompanied by a sealed letter similarly marked, containing the name and address of the Reporter—initials must not be used.

No sealed letter, unless belonging to a Report found entitled to at least one-half of the premium offered, will be opened without the author's consent.

Reports for which a Premium, or one-half of it, has been awarded, become the property of the Society, and cannot be published in whole or in part, nor circulated in any manner, without the consent of the Directors. All other papers will be returned to the authors, if applied for within twelve months.

When a Report is unsatisfactory, the Society is not bound to award the whole or any part of a premium.

All Reports must be of a practical character, containing the results of the writer's own observation or experiment, and the special conditions attached to each Premium must be strictly fulfilled. General essays, and papers compiled from books, will not be rewarded. Weights and measurements must be indicated by the Imperial standards.

The Directors, before awarding a Premium, shall have power to require the writer of any report to verify the statements made in it.

The decisions of the Board of Directors are final and conclusive as to all Premiums, whether for Reports or at General or District Shows; and it shall not be competent to raise any question or appeal touching such decisions before any other tribunal.

The Directors will welcome papers from any Contributor on any suitable subject not included in the Premium List; and if the topic and the treatment of it are both approved, the Writer will be remunerated, and his paper published.

## CLASS I.

### R E P O R T S.

#### SECTION 1.—THE SCIENCE AND PRACTICE OF AGRICULTURE.

##### FOR APPROVED REPORTS.

1. On the Agriculture of the Counties of Clackmannan and Kinross—Twenty Sovereigns. To be lodged by 1st November 1881.

The Report should embrace full details of the different systems of Farm Management observed in the Counties, and of the progress which Agriculture and other industries have made within the last 25 years.

2. On the Agriculture of the County of Lanark—Forty Sovereigns. To be lodged by 1st November 1881.

The Report should embrace full details of the different systems of Farm Management observed in the County, and of the progress which Agriculture and other industries have made within the last 25 years.

3. On the Agriculture of the County of Stirling—Twenty Sovereigns. To be lodged by 1st November 1881.

The Report should embrace full details of the different systems of Farm Management observed in the County, and of the progress which Agriculture and other industries have made within the last 25 years.

4. On the Agriculture of the Counties of Elgin and Nairn—Thirty Sovereigns. To be lodged by 1st November 1882.

The Report should embrace full details of the different systems of Farm Management observed in the Counties, and of the progress which Agriculture and other industries have made within the last 25 years.

5. On the best method of ascertaining, at the termination of a lease, the unexhausted value of tile drainage or other work of that kind, performed by a tenant during the currency of a lease—Fifteen Sovereigns. To be lodged by 1st November 1881.

6. On the best method of ascertaining, at the termination of a lease, the unexhausted value of lime applied by a tenant during the currency of a lease, specifying the difference (if any) between different kinds of lime and also gas or refuse lime—Fifteen Sovereigns. To be lodged by 1st November 1881.

7. On the best method of ascertaining, at the termination of a lease, the unexhausted manurial value of manures and feeding stuffs applied to and consumed upon a farm by a tenant, giving details, based on experience, of such manurial value, and the effect of different crops or rotations of crops in exhausting it—Fifteen Sovereigns. To be lodged by 1st November 1881.

8. On the Physiological Distinctions in the condition of the Scottish Peasantry in different Districts—Thirty Sovereigns. To be lodged by 1st November 1881.

The Reporter must furnish statistics of the longevity, &c., of the peasantry, as contrasted with other classes, and give suggestions for the amelioration of any causes which affect them injuriously.

9. On the results of experiments for fixing and retaining the volatile and soluble ingredients in farm-yard manure—Twenty Sovereigns. To be lodged by 1st November 1881.

The Report must detail the treatment adopted to fix and retain these ingredients—the materials used for that purpose—and the quantity and cost thereof—comparative analyses of the manure with and without the treatment, and also a statement of the crops grown with manure with and without such treatment, must be given by the Reporter. The experiments to have extended over at least two years and crops.

10. On the results of experiments for ascertaining the comparative value of farm-yard manure obtained from cattle fed upon different varieties of food, by the application of such manures to farm crops—Twenty Sovereigns. To be lodged by 1st November in any year.

The Report must state the effects produced on two successive crops by the application of manure obtained from cattle fed on different sorts of food, such as turnips and straw alone; and turnips and straw, with an addition of oil-cake, linseed, bean-meal, grain, or other substances. The animals should be as nearly as possible of the same age, weight, condition, and maturity, and each lot should receive daily the same quantity of litter; and, except as to the difference of food, they must be treated alike.

The preparation of the manure, by fermentation or otherwise, should be in every respect the same; and it is desirable that not less than two several experiments be made with each kind, and that the ground to which it is to be applied be as equal as possible in quality and condition.

11. On the comparative value of manure made in the ordinary manner, and of the manure kept under cover till applied to the land—Twenty Sovereigns. To be lodged by 1st November in any year.

The experiment may be conducted either with manure made in the open straw-yard, contrasted with that made in covered hammels or boxes, or with manure made in feeding houses, part of which shall have been placed under cover, and part removed to the open dung-pit, and kept carefully unmixed with any other manure. Preference will be given to experiments embracing both of these modes. The cattle must be fed and littered alike. There must be at least an acre of land experimented on with each sort of manure; the different lots must be manured to the same extent, and be equal in soil, and the crops must be accurately weighed and measured on two separate portions of each lot, not less than 20 poles. The result, as given by two successive crops, to be reported.

12. On the means successfully employed for obtaining new Agricultural Plants, or new and superior varieties, or improved sub-varieties, of any of the cereal grains, grasses, roots, or other agricultural plants at present cultivated in this country—Medals, or sums of Money not exceeding Fifty Sovereigns. To be lodged by 1st November in any year.

It is necessary that the varieties and sub-varieties reported upon shall have been proved capable of reproduction from seed, and also that the relation they bear to others, or well-known sorts, should be stated. The Reporter is further requested to mention the effects that he may have observed produced by different soils, manures, &c., on the plants forming the subject of report, and how far he may have ascertained such effects to be lasting.

Should any improved variety reported upon be the result of direct experiment by cross impregnation, involving expense and long-continued attention, a higher premium will be awarded.

13. On the cultivation of the Cabbage as a field crop—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1881.

The experiment must be conducted in Scotland on not less than one acre, and contrasted with a like extent under turnips in the same field. Both lots must have been under one rotation, and must be prepared and manured in the same manner.

14. On the hardy and useful Herbaceous Plants of any country where such climate exists as to induce the belief that the plants may be beneficially introduced into the cultivation of Scotland—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

Attention is particularly directed to the Grains and Grasses of China, Japan, the Islands of the Eastern Archipelago, the Himalaya country,

the Falkland and South Sea Islands, California, and the high north-western district of America.

Reporters are required to give the generic and specific names of the plants treated of, with the authority for the same—together with the native names, so far as known; and to state the elevation of the locality and nature of the soil in which they are cultivated, or which they naturally inhabit, with their qualities or uses; and it is further requested that the descriptions be accompanied, in so far as possible, with specimens of the plants, and their fruit, seed, and other products.

15. On the adulteration of Agricultural Seeds, whether by colouring, mixing, or otherwise, and the best means of detecting the same, and preventing their sale—Ten Sovereigns. To be lodged by 1st November 1881.

16. On the comparative advantages of fattening Cattle in stalls, in loose houses or boxes, and in sheds or hammels—Twenty Sovereigns. To be lodged by 1st November in any year.

The Report must detail the comparative result of actual experiments. The same quantities and kinds of food must be used. Information is required as to the comparative expense of attendance, the cost of erecting the buildings, and any other circumstance deserving of attention. The state of the weather during the experiment, in point of temperature and wetness, and the advantages or disadvantages of clipping cattle put up to feed, must be particularly noted and reported.

17. On experiments for ascertaining the actual addition of weight to growing or fattening Stock, by the use of different kinds of food—Twenty Sovereigns. To be lodged by 1st November in any year.

The attention of the Experimenter is directed to turnips, carrots, beet, mangold-wurzel, potatoes, cabbage, as well as to beans, oats, barley, Indian corn, linseed, oil-cake or rape-cake, and to the effect of warmth and proper ventilation, and the difference between food cooked and raw. The above roots and other kinds of food are merely suggested; competitors are neither restricted to them nor obliged to experiment on all of them.

When experiments are made with linseed and cake, attention should be paid to the comparative advantages, economically and otherwise, of the substance in these two states.

Before commencing the comparative experiments, the animals must be fed alike for some time previously.

The progress of different breeds may be compared. This will form an interesting experiment of itself, for Reports of which encouragement will be given.

*N.B.*—The experiments specified in the two previous subjects must be conducted over a period of not less than three months. No lot shall consist of fewer than four Cattle or ten Sheep. The animals selected

should be of the same age, sex, and breed, and, as nearly as possible, of the same weight, condition, and maturity. The live weight before and after the experiment must be stated, and, if killed, their dead weight and quantity of tallow.

18. On the Blackfaced Breed of Sheep, and the means that have been or might be used for its improvement—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1881.

19. On the cultivation of Prickly Comfrey (*Symphytum asperinum*), and its use as a fodder plant—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1881.

Details of its growth and treatment and any particulars as to the mode of cultivation, with suggestions for the more general introduction of the best varieties must be given.

20. On the influence of soil and geological formation in the production of Disease—Ten Sovereigns. To be lodged by 1st November 1881.

21. On the nature, symptoms, causes, preventive, and remedial treatment, and *post-mortem* appearances of Sturdy in Sheep—Five Sovereigns. To be lodged by 1st November 1881.

22. On the effect of Sewage upon the Animal System, introduced either with drinking water or with herbage when sewage has been used as a top-dressing—Ten Sovereigns. To be lodged by 1st November 1881.

23. On a description of any scheme whereby Town Sewage has been successfully utilised for irrigation in Agriculture—Twenty Sovereigns. To be lodged by 1st November in any year.

The scheme described must have been in operation for at least two years—the description to include (1) the manner in which the land was drained and prepared for irrigation, and the cost of preparing it per acre; (2) the quantity of sewage used per acre, and the mode in which it is applied to the fields; (3) the annual cost per acre of wages, &c., in working the process; (4) the kind, amount, and value of the crops obtained per acre.

24. On the best system of Bee Culture, describing the mode of obtaining honey of the purest quality without destroying the Bees—Five Sovereigns. To be lodged by 1st November 1881.

The Report must give general rules for bee management, and specify the best kind of hives and the average profit derived from each hive.

25. On any useful practice in Rural Economy adopted in other countries, and susceptible of being introduced with advantage into Scotland—The Gold Medal. To be lodged by 1st November in any year.

The purpose chiefly contemplated by the offer of this premium is to induce travellers to notice and record such particular practices as may seem calculated to benefit Scotland. The Report to be founded on personal observation.

## SECTION 2.—ESTATE IMPROVEMENTS.

### FOR APPROVED REPORTS.

1. By the Proprietor in Scotland who shall have executed the most judicious, successful, and extensive improvement—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

Should the successful Report be written for the Proprietor by his resident factor or farm manager, a Medium Gold Medal will be awarded to the writer in addition to the Gold Medal to the Proprietor.

The merits of the Report will not be determined so much by the mere extent of the improvements, as by their character and relation to the size of the property. The improvements may comprise reclaiming, draining, enclosing, planting, road-making, building, and all other operations proper to landed estates. The period within which the operations may have been conducted is not limited, except that it must not exceed the term of the Reporter's proprietorship.

2. By the Proprietor in Scotland who shall have erected on his estate the most approved Farm-buildings—The Gold Medal. Reports, Plans, and Specifications to be lodged by 1st November in any year.

3. By the Proprietor or Tenant in Scotland who shall have reclaimed within the ten preceding years not less than forty acres of waste land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

4. By the Tenant in Scotland who shall have reclaimed within the ten preceding years not less than twenty acres of waste land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

5. By the Tenant in Scotland who shall have reclaimed not less than ten acres within a similar period—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The Reports in competition for Nos. 3, 4, and 5 may comprehend such general observations on the improvement of waste lands as the writer's



experience may lead him to make, but must refer especially to the lands reclaimed—to the nature of the soil—the previous state and probable value of the subject—the obstacles opposed to its improvement—the details of the various operations—the mode of cultivation adopted—and the produce and value of the crops produced. As the required extent cannot be made up of different patches of land, the improvement must have relation to one subject; it must be of a profitable character, and a rotation of crops must have been concluded before the date of the Report. *A detailed statement of the expenditure and return* and a certified measurement of the ground are requisite.

6. By the Proprietor or Tenant in Scotland who shall have improved within the ten preceding years the pasturage of not less than thirty acres, by means of top-dressing, draining, or otherwise, without tillage, in situations where tillage may be inexpedient—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

7. By the Tenant in Scotland who shall have improved not less than ten acres within a similar period—The Minor Gold Medal. To be lodged by 1st November in any year.

Reports in competition for Nos. 6 and 7 must state the particular mode of management adopted, the substances applied, the elevation and nature of the soil, its previous natural products, and the changes produced.

### SECTION 3.—MACHINERY.

#### FOR APPROVED REPORTS.

1. On such inventions or improvements, by the reporters, of any implement or machine as shall be deemed by the Society of public utility—Medals, or sums of money not exceeding Fifty Sovereigns. To be lodged at any time.

Reports should be accompanied by drawings and descriptions of the implement or machine, and, if necessary, by a model.

2. On the best and most improved Cattle Truck for feeding and watering the animals in transit—Twenty Sovereigns. To be lodged by 1st November 1881.

Reports must be accompanied with drawings and description, or, if necessary, by a model.

### SECTION 4.—FORESTRY DEPARTMENT.

#### FOR APPROVED REPORTS.

1. By the Proprietor in Scotland who shall, within the five

PREMIUMS OFFERED BY THE SOCIETY IN 1881.

preceding years, have planted not less than 150 acres—The Gold Medal. To be lodged by 1st November in any year.

- The whole planting operations which may have been conducted by the Reporter within the five years, whether completed or not, must be embraced, and he must state the expense—description of soils—age, kind, and number of trees planted per acre—mode of planting, draining, and fencing—general state of the plantation—and any other observations of interest.

2. On Plantations of not less than eight years' standing, formed on deep peat bog—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1881.

- The premium is strictly applicable to deep peat or flow moss ; the condition of the moss previous to planting, as well as at the date of the Report, should, if possible, be stated.

The Report must describe the mode and extent of the drainage, and the effect it has had in subsiding the moss—the trenching, levelling, or other preliminary operations that may have been performed on the surface—the mode of planting—kinds, sizes, and numbers of trees planted per acre—and their relative progress and value, as compared with plantations of a similar age and description grown on other soils in the vicinity.

3. On the more extended introduction of hardy, useful, or ornamental Trees, which have not hitherto been generally cultivated in Scotland—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The Report should specify as distinctly as possible the kind of trees introduced. The adaptation of the trees for use or ornament, and their comparative progress should be mentioned. Attention is directed to the introduction of any tree as a nurse in young plantations, which by growing rapidly for several years, and attaining maturity when at the height of 20 or 25 feet, might realise the advantage and avoid the evils of thick planting.

4. On the *Picea grandis* and its probable suitability as a Timber Tree in Scotland, with detailed statistics of its progress in the country—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1881.

5. On the varieties of Trees best adapted for planting as shelter in the Islands of Scotland—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1881.

6. On the old and remarkable Elms in Scotland—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1881.

Details of their growth, measurements, and condition, and any particulars of their history, must be given. The measurements to

be taken by the Reporter himself, and at 5 feet from the ground, if possible. Photographs and drawings are desirable.

7. On the old and remarkable Lime Trees in Scotland—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1881.

Details of their growth, measurements, and condition, and any particulars of their history, must be given. The measurements to be taken by the Reporter himself, and at 5 feet from the ground, if possible. Photographs and drawings are desirable.

8. On the most suitable varieties of Trees, adapted to various soils and altitudes, to be left as standards in cutting down plantations, with a view to the encouragement of a healthy undergrowth of herbage and grasses for the purpose of grazing cattle and sheep, with a list of those grasses and forage plants best adapted for growth in the locality under such conditions—Ten Sovereigns. Reports to be lodged by 1st November 1881.

Reports need not be confined to Scotland. Information is desired from such countries as India.

9. On the deterioration in quality and durability of Home-Grown Timber at the present day, especially regarding Scotch Fir, as compared with the timber of the old Scotch forests, and suggestions for a remedy—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1881.

10. On the Cutting and Transport of Firewood (soft and hard wood), with detailed statement of charges—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1881.

In many districts large branches and tops of trees are burned up, which in England, and much more on the Continent, are sold at a profit. The Report should state the system pursued, and contain practical suggestions for utilising fragments now destroyed.

11. On the more extended cultivation in Scotland of Charcoal-producing Plants, for gunpowder or commercial purposes—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1881.

Reference to be made to suitable varieties of plants not generally grown in this country for that purpose, such as *Rhamnus Frangula*, prices realisable, and suggestions for their more general introduction, treatment, &c.

12. On the Woods, Forests, and Forestry in the county of Perth—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1881.

13. On the Woods, Forests, and Forestry in the county of Ross—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1881.

14. On the Woods, Forests, and Forestry in the county of Inverness—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1881.

15. On the comparative advantages of High Forest with Coppice, or Coppice with a limited number of Standard Trees—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1881.

16. On the utilisation of waste produce of Forests and Woodlands, as matter for making, either separately or in combination with other substances, an Artificial Fuel—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1881.

17. On the Insects most injurious to Forest Trees, and the diseases occasioned by them, and the best means of prevention—Twenty Sovereigns. To be lodged by 1st November 1881.

The Report to be accompanied, where practicable, by specimens of the insects.

## CLASS II.

### DISTRICT COMPETITIONS.

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*The Money Premiums and Medals awarded at District Competitions will be issued in January next. No payments must, therefore, be made by the Secretary or Treasurer of any local Association.*

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*Grants in aid of DISTRICT COMPETITIONS for 1882 must be applied for before 1st NOVEMBER, on Forms to be obtained from the Secretary.*

*When a Grant has expired, the District cannot apply again for aid for two years.*

#### SECTION 1.—CATTLE.

*Note.*—The Society's Cattle Premiums are granted to each District for three alternate years, on condition that the District shall, in the two intermediate years, continue the Competitions by offering for the same description of stock a sum not less than one-half of that given by the Society.

At the intermediate Competitions, a Silver Medal will be placed at the disposal of the Committee, to be awarded for the Best Bull which has gained a first prize at a previous District or General Show, and of the Class for which the District receives Premiums; also three Medium Silver Medals to be given along with the first prize in the three Classes of Cattle, provided there are not fewer than two lots exhibited in each Class.

The selection of the Breed is left to the local Committee. See Rule 6.

#### DISTRICTS.

1. DISTRICT OF TURRIFF.—*Convener*, Alexander Stuart of Laithers, Turriff; *Secretary*, William Ingram, Sunnyhill, Turriff. Granted 1877.
2. DISTRICT OF AYONDALE.—*Convener*, Thomas Tennant of Priestgill, Strathaven; *Secretary*, William Lambie of Hallburn, Strathaven. Granted 1877.
3. DISTRICT OF WEEM.—*Convener*, Sir Robert Menzies of Menzies, Bart., Farleyer, Aberfeldy; *Secretary*, R. B. Barrett, Camserney Cottage, Aberfeldy. Granted 1877.
4. DISTRICT OF THE DEESIDE UNION.—*Convener*, Colonel Innes of Learney, Torphins; *Secretary*, James Shaw, Tillychning, Lumphanan. Granted 1879.
5. DISTRICT OF LORN.—*Convener*, Colonel M'Dougall of Dunollie, Oban; *Secretary*, Donald Macgregor, Solicitor, Oban. Granted 1879.
6. DISTRICT OF INVERARAY.—*Convener and Secretary*, John Macarthur, Inveraray. Granted 1881.
7. DISTRICT OF FORMARTINE.—*Convener*, The Earl of Aberdeen; *Secretary*, Alex. Davidson, Mains of Cairnbrogie, Old Meldrum. Granted 1878.

8. DISTRICT OF THE KINGLASSIE SOCIETY.—*Convener*, R. Sinclair Aytoun of Inchdairnie, Kirkcaldy ; *Secretary*, David Beath, Auchmuir, Leslie. Granted 1878.
9. COUNTY OF AYR.—*Convener*, Hon. G. R. Vernon, Auchans House, Kilmarnock ; *Secretary*, James M'Murtrie, Ayr. Granted 1878.
10. CENTRAL BANFFSHIRE.—*Convener*, William Longmore, Keith ; *Secretary*, J. Geddes Brown, Keith. Granted 1880.
11. STIRLINGSHIRE.—*Convener*, Sir James R. Gibson Maitland of Clifton Hall, Bart., Craigend, Stirling ; *Secretary*, Robert Taylor, 22 Barnton Place, Stirling. Granted 1880.
12. ISLANDS OF MULL, COLL, AND TIRREE.—*Convener*, James Noel Forsyth of Quinish, Tobermory ; *Secretary*, Robert Lang, Aros Mains, Aros, Mull. Granted 1880.
13. RENTFREWSHIRE.—*Convener*, P. Comyn Macgregor of Brediland, Lonend House, Paisley ; *Secretary*, William Bartlemore, County Buildings, Paisley. Granted 1880.

## PREMIUMS.

1. Best Bull, of any pure breed, having gained a previous Highland and Agricultural Society's First Prize, . . . . . The Silver Medal.
2. Best Bull, 3-year old and upwards, of any pure breed,  
Medium Silver Medal and £4  
Second best, . . . . . £3  
Third best, . . . . . £1
3. Best Bull, 2-year old and under, of any pure breed,  
Medium Silver Medal and £3  
Second best, . . . . . £2  
Third best, . . . . . £1
4. Best 2-year old Heifer (if Highland breed, 3 years), of any pure breed,  
Medium Silver Medal and £3  
Second best, . . . . . £2  
Third best, . . . . . £1

The dates of calving of cattle will be counted as from on and after January 1, except polled Angus and Aberdeen, which will be counted as from on and after December 1.

## In 1881.

Nos. 1, 2, and 3 are in competition for the last year.

Nos. 4 and 5 for the second year.

No. 6 for the first year.

Nos. 7, 8, 9, 10, 11, 12, and 13 compete for local Premiums.

## SECTION 2.—HORSES.

## FOR AGRICULTURAL PURPOSES.

*Note.*—The Society's Stallion Premiums are granted to each District for two years, and are followed by Premiums for other two years for Brood Mares, and again for a similar period by Premiums for Entire Colts and Fillies.

## 1. STALLIONS.

1. DISTRICT OF CUPAR AND ST ANDREWS.—*Convener*, David Bayne Mel drum of Kincahle, St Andrews ; *Secretary*, William Dingwall, Rasmornie, Ladybank. Granted 1880.
2. DUMFRIES HORSE ASSOCIATION.—*Convener*, John M'Tier of Ladyfield, Dumfries ; *Secretary*, D. Robison, 48 Irish Street, Dumfries. Granted 1880.
3. NAIRNSHIRE.—*Convener*, Robert Anderson of Lochdhu, Nairn ; *Secretary*, John Joss, Budgate, Cawdor. Granted 1880.

4. EARL OF SELKIRK'S TENANTRY AND DISTRICT.—*Convener*, Andrew Lusk, Howell, Kirkcudbright; *Secretaries*, D. G. Williamson, Bombie, Kirkcudbright; and James Muir, Lochfergus, Kirkcudbright. Granted 1880.
5. DISTRICT OF CENTRAL STRATHEARN.—*Convener*, John Kerr, Rossie Ochil, Bridge of Earn; *Secretary*, Robert Gardiner, Chapel Bank, Auchterarder. Granted 1880.
6. DISTRICT OF ESKDALE AND LIDDESDALE.—*Convener*, William Little of Whithaugh, Burnfoot, Ewes, Langholm; *Secretary*, Thos. Stevenson, Langholm. Granted 1881.
7. MORAYSHIRE.—*Convener*, Robert M'Kessack, of Ardgry and Roseisle, Forres; *Secretary*, William Macdonald, Caledonian Bank Buildings, Elgin. Granted 1881.

#### PREMIUM.

Best Stallion, not under 3 years, and not above 12 years old, . . . £25

In 1881.

Nos. 1, 2, 3, 4, and 5 are in competition for the last year.

Nos. 6 and 7 for the first year.

#### 2. BROOD MARES.

1. EASTERN DISTRICT OF BERWICKSHIRE.—*Convener*, John Allan, Redheugh, Cockburnspath; *Secretary*, James Gibson, Guns-green, Ayton. Granted 1880.
2. DISTRICT OF LAUDERDALE.—*Convener*, George M'Dougal, Blythe, Lauder; *Secretary*, Thomas Broomfield, Lauder. Granted 1880.
3. MACHARS DISTRICT OF WIGTOWNSHIRE.—*Convener*, Sir Herbert E. Maxwell of Monreith, Bart., M.P., Port William; *Secretary*, Charles M. Routledge, Banker, Port William. Granted 1880.
4. COUNTY OF PEEBLES.—*Convener*, Lord Arthur Cecil, Orchard Mains, Innerleithen; *Secretaries*, William Riddell, Howford, Peebles; and A. Alexander, West Linton. Granted 1880.
5. EASTERN DISTRICT OF STIRLINGSHIRE.—*Convener*, Ralph Stark of Summerford, Falkirk; *Secretary*, Thomas Binnie, Falkirk. Granted 1880.
6. DISTRICT OF THE LESMAHAGOW SOCIETY.—*Convener*, Gavin Hamilton of Auldtown, Lesmahagow; *Secretary*, John Hamilton, British Linen Co. Bank, Lesmahagow. Granted 1881.
7. DISTRICT OF CARRICK.—*Convener*, John Rankine of Beoch, Lochlands, Maybole; *Secretary*, David Brown, Maybole. Granted 1881.

#### PREMIUMS.

- |                     |                         |    |
|---------------------|-------------------------|----|
| 1. Best Brood Mare, | Medium Silver Medal and | £4 |
| 2. Second best,     | “ “ “ “ “               | £3 |
| 3. Third best,      | “ “ “ “ “               | £1 |

In 1881.

Nos. 1, 2, 3, 4, and 5 are in competition for the last year.

Nos. 6 and 7 for the first year.

#### 3. ENTIRE COLTS AND FILLIES.

1. DISTRICT OF THE DALBEATTIE SOCIETY.—*Convener*, W. H. Maxwell of Munches, Dalbeattie; *Secretary*, R. W. Macnab, Union Bank, Dalbeattie. Granted 1880.

2. REINS DISTRICT OF WIGTOWNSHIRE.—*Convener*, R. Vans-Agnew of Barnbarroch ; *Secretary*, Hugh Adair, Stranraer. Granted 1880.
3. DISTRICT OF AUCHTERMUCHTY.—*Convener*, James Thom, Leden Urquhart, Strathmiglo ; *Secretary*, Archibald Walker, Auchtermuchty. Granted 1880.
4. DISTRICT OF THE EAST OF FIFE SOCIETY.—*Convener*, John Gilmour yr. of Lundin, Montrave, Kennoway ; *Secretary*, John Flockhart, Colinsburgh. Granted 1880.
5. COUNTY OF CLACKMANNAN.—*Convener*, James Johnstone of Alva ; *Secretary*, D. & T. Fisher, Jellyholm, Alloa. Granted 1881.
6. DISTRICT OF LOCKERBIE.—*Convener*, Sir Alexander Jardine of Applegarth, Bart., Jardine Hall, Lockerbie ; *Secretary*, David Dobie, Banker, Lockerbie. Granted 1881.

## PREMIUMS.

- |    |  |                         |      |
|----|--|-------------------------|------|
| 1. | Best Entire Colt, foaled after 1st January 1879, | Medium Silver Medal and | £3   |
|    | Second best,                                     |                         | £2   |
|    | Third best,                                      |                         | £1   |
| 2. | Best Entire Colt, foaled after 1st January 1880, | Medium Silver Medal and | £2   |
|    | Second best,                                     |                         | £1   |
|    | Third best,                                      |                         | 10s. |
| 3. | Best Filly, foaled after 1st January 1879,       | Medium Silver Medal and | £3   |
|    | Second best,                                     |                         | £2   |
|    | Third best,                                      |                         | £1   |
| 4. | Best Filly, foaled after 1st January 1880,       | Medium Silver Medal and | £2   |
|    | Second best,                                     |                         | £1   |
|    | Third best,                                      |                         | 10s. |

In 1881.

Nos. 1, 2, 3, and 4 are in competition for the last year.

Nos. 5 and 6 for the first year.

### SECTION 3.—SHEEP.

*Note.*—The Society's Sheep Premiums are granted to each District for three alternate years, on condition that the District shall, in the two intermediate years, continue the Competitions by offering for the same description of stock a sum not less than one-half of that given by the Society.

At the intermediate Competitions, a Silver Medal will be placed at the disposal of the Committee, to be awarded for the best Tup which has gained a first prize at a previous District or General Show, and of the class for which the District receives Premiums; also four Medium Silver Medals, to be given along with the first prize in the four Classes of Sheep, provided there are not less than two lots in each class. The selection of the Breed is left to the local Committee. See Rule 6.

## DISTRICTS.

1. DISTRICT OF THE NORTHERN PASTORAL CLUB.—*Convener*, Sir Kenneth S. Mackenzie of Gairloch, Bart., Conan House, Dingwall; *Secretary*, Walter Mundell, Moy, Muir of Ord. Granted 1877.
2. DISTRICT OF NITHSDALE.—*Convener*, John Gilchrist Clark of Speddoch, Dabton, Thornhill; *Secretary*, Wm. Austin, Bank Agent, Thornhill. Granted 1877.



3. DISTRICT OF THE BORDER UNION SOCIETY.—*Convener*, Lord Polwarth, Mertoun House, St Boswells; *Secretary*, John Usher, 25 Bridge Street, Kelso. Granted 1878. (In abeyance in 1880.)
4. DISTRICT OF ATHOLE AND WEEM.—*Convener*, Archibald Butter of Fasakally, Pitlochry; *Secretary*, James Mitchell, Solicitor, Pitlochry. Granted 1879.
5. DISTRICT OF THE UNITED EAST LOTHIAN SOCIETY.—*Convener*, Sir Hew Dalrymple of North Berwick, Bart., Luchie, North Berwick; *Secretaries*, Richardson and Gemmell, Haddington. Granted 1879.
6. DISTRICT OF NETHER LORN.—*Convener*, Donald Johnston, Kilbride, Easdale, Oban; *Secretary*, Angus Whyte, Easdale, Oban. Granted 1879.
7. DISTRICT OF ARGYLL.—*Convener*, Sir John W. P. Campbell Orde of Kilmory, Bart., Lochgilphead; *Secretary*, A. M'Nair, Ri-Cruin, Lochgilphead. Granted 1879.
8. ISLANDS OF ISLAY, JURA, AND COLONSAY.—*Convener*, Kirkman Finlay of Dunlossit, Portaskaig, Islay; *Secretary*, Samuel M. M'Conechy, Daill, Bridgend, Islay. Granted 1878.
9. DISTRICT OF DUNOON.—*Convener*, A. S. Finlay of Castle Toward, Greenock; *Secretary*, Archibald Mitchell, junior, Clydesdale Bank, Dunoon. Granted 1880.
10. DISTRICT OF DALKEITH.—*Convener*, Sir James Gardiner Baird of Saughton Hall, Bart., Inch House, Liberton; *Secretary*, William Harper, Sheriffhall Mains, Dalkeith. Granted 1880.
11. UPPER WARD OF LANARKSHIRE.—*Convener*, John Ord Mackenzie of Dolphinton; *Secretary*, David Oswald, Abington, N.B. Granted 1880.
12. DISTRICT OF LOCHABER.—*Convener*, D. P. M'Donald, Invernevis, Fort-William; *Secretary*, N. B. Mackenzie, British Linen Co. Bank, Fort-William. Granted 1880.
13. DISTRICT OF LOWER ANNANDALE.—A. H. Johnstone Douglas of Lockerbie, Glen Stuart, Annan; *Secretary*, Wm. Roddick, Annan. Granted 1880.

## PREMIUMS.

- |   |                            |
|---|----------------------------|
| 1. Best Tup having gained a previous Highland and Agricultural Society's First Prize, | The Silver Medal.          |
| 2. Best Tup above One Shear,  | Medium Silver Medal and £3 |
| Second best,  | £1                         |
| Third best,   | 10s.                       |
| 3. Best Shearling Tup,  | Medium Silver Medal and £3 |
| Second best,  | £1                         |
| Third best,   | 10s.                       |
| 4. Best 3 Ewes above One Shear,   | Medium Silver Medal and £3 |
| Second best,  | £1                         |
| Third best,   | 10s.                       |
| 5. Best 3 Gimmers or Shearling Ewes,  | Medium Silver Medal and £3 |
| Second best,  | £1                         |
| Third best,   | 10s.                       |

## In 1881.

Nos. 1 and 2 are in competition for the last year.

Nos. 3, 4, 5, 6, and 7 for the second year.

Nos. 8, 9, 10, 11, 12, and 13 compete for local Premiums.

## SECTION 4.—SWINE.

The Society's Swine Premiums are given for three consecutive years.

## PREMIUMS.

- |  |                            |
|--|----------------------------|
| 1. Best Boar having gained a previous Highland and Agricultural Society's First Prize, | The Silver Medal.          |
| 2. Best Boar,  | Medium Silver Medal and £3 |
| Second best,   | £1                         |
| Third best,  | 10s.                       |
| 3. Best Brood Sow,   | Medium Silver Medal and £2 |
| Second best,   | £1                         |
| Third best,  | 10s.                       |

In 1881.

No application has been received.

## SECTION 5.—DAIRY PRODUCE.

The Society's Dairy Premiums are given for three consecutive years.

## PREMIUMS.

- |  |                            |
|--|----------------------------|
| 1. Best Couple of Sweet Milk Cheeses belonging to a Proprietor,          | The Silver Medal.          |
| 2. Best Couple of Sweet Milk Cheeses,                                    | Medium Silver Medal and £2 |
| Second best,   | £1                         |
| Third best,  | 10s.                       |
| 3. Best Cured Butter (not less than 14 lbs.), belonging to a Proprietor, | The Silver Medal.          |
| 4. Best Cured Butter (not less than 14 lbs.),                            | Medium Silver Medal and £2 |
| Second best,   | £1                         |
| Third best,  | 10s.                       |

In 1881.

No application has been received.

## RULES OF COMPETITION.

1. The Members of the Highland and Agricultural Society connected with the respective districts are appointed Committees for arranging the Competitions, the Convener being appointed by the Directors: five members to be a quorum.

2. The Convener of each District shall summon a meeting of Committee for the purpose of determining the time and place of Competition, the nomination of Judges, and other preliminary arrangements. The time and place (which must be within the bounds of the District, unless in reference to Stallions) shall be publicly intimated by Conveners.

3. The Money Premiums and Medals awarded at District Competitions will be paid in January next, by precepts issued by the Directors. No payments must, therefore, be paid by the Secretary or Treasurer of any local Association. Medals will be issued at same time.

4. Stock must be the property of the Exhibitor at the date of Entry. *No entry shall be received later than one week previous to the Show.* Entry-Money shall not exceed 2½ per cent. on the amount of the Premium to be competed for.

5. The Competitions (except for Stallions to serve in the District) must take place between the 1st of April and the 26th of October, and are open to general competition to all parties within the District, whether members

of the local Association or not. The Stallion Premiums are open to all comers, or the Horses may be selected at the Glasgow Stallion Show on permission to that effect being obtained.

6. The Committee shall select the breed, and specify it in the returns. In Cattle the animals exhibited must belong to one of the following pure breeds—Short-horn, Ayrshire, Polled (Galloway, Angus, or Aberdeen), Highland. The Bulls may be of one breed, and the Heifers of another. In Sheep, the breeds must be Leicester, Cheviot, or Blackfaced.

7. Stock of an inferior description, or which does not fall within the prescribed regulations, shall not be placed for competition.

8. The Premiums shall not be divided. In Cattle, Horses (except Stallions to serve in the district), Sheep, and Swine, five lots in each Class will warrant the award of full, and three lots of half, Premiums. In Dairy Produce, eight Exhibitors in any one Class will warrant an award of full, and four of half, Premiums. A Competitor may exhibit two lots in each class, except in Dairy Produce, where only one lot is allowed from the same farm. For the Silver Medal to former first prize animals two lots are required. No animal to be allowed to compete in more than one section.

9. To authorise the award of the Medals in the intermediate year, there must be not less than two lots in each Class, and the Society's Regulations must be adhered to.

10. An animal which has gained the Highland and Agricultural Society's first Money Premium at a previous District or General Show is inadmissible in the same Class (except in the case of Stallions and in that of Bulls and Tups for the Silver Medal, under section I.); and one which has gained a second Money Premium can only thereafter compete in that Class for the first.

11. A Bull the property of two or more Tenants may compete, although the Exhibitors may not be Joint-Tenants.

12. Bulls for which Money Premiums are awarded may be required to serve in the District at least one season; the rate of service to be fixed by the Committee, and the prizes may be withheld till the conditions are fulfilled. Premiums for the Heifers may be retained till the animals are certified to have calved.

13. Evidence must be produced that the Prize Stallions have had produce.

14. Mares must have foals at foot (except when death of foal is certified), or be entered as being in foal; in the latter case payment of the Premiums will be deferred till certificate of birth, which must be within 11 months from the date of the Show.

15. All Prize Tups must serve within the District during the season following the Competition. Ewes and Gimmers must be taken from the Exhibitor's stock, and must have been bred by him in the District; and Ewes must have reared Lambs during the ordinary season of the District.

16. Sheep must have been clipped bare during the season, and the Judges are instructed to examine the fleeces of the sheep selected for prizes, and to cast those on which they find any of the former fleece. Fleeces must not be artificially coloured.

17. Should it be proved to the satisfaction of the Committee that an animal has been entered under a false name, pedigree, or description, for the purpose of misleading the Committee or Judges as to its qualifications or properties, the case shall be reported to the Directors, and submitted by them to the first General Meeting, in order that the Exhibitor may be disqualified from again competing for the Society's Premiums, and his name, if he is a member, struck from the roll, or his case otherwise disposed of as the Directors may determine.

18. When an animal has previously been disqualified by the decision of any Agricultural Association in Great Britain or Ireland, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail

to state it and the grounds thereof, in his entry, to enable the Committee to judge of its validity.

19. Competitors must certify that the Butter and Cheese exhibited by them are average specimens of the produce of their dairies in 1881, and that the quantity produced during the season has not been less than 1 cwt. of Butter, or 2 cwt. of Cheese.

20. It is to be distinctly understood that in no instance does any claim lie against the Highland and Agricultural Society for expenses attending a show of stock beyond the amount of the Premiums offered.

21. Blank reports will be furnished to the Conveners and Secretaries of the different Districts. These must, in all details, be completed, and lodged with the Secretary *on or before the 1st of November next*, for the approval of the Directors, against whose decisions there shall be no appeal.

22. A report of the Competitions and Premiums awarded at the *intermediate* local shows in the several Districts for Cattle and Sheep, signed by a member of the Society, must be transmitted to the Secretary *on or before the 1st of November in each year*, otherwise the Society's grants shall terminate.

23. When a grant has expired, the District cannot apply again for aid for two years.

#### SECTION 6.—SPECIAL GRANTS.

£50 to Glasgow Agricultural Society.—*Secretary*, Mark Marshall, 145 St Vincent Street, Glasgow.

£20 to the Ayrshire Agricultural Association, to be competed for at the Dairy Produce Show at Kilmarnock.—*Convener*, The Hon. G. R. Vernon, Auchans House, Kilmarnock; *Secretary*, James M'Murtrie, Ayr. Granted 1872.

£3 to Egilshay Society for three consecutive years.—*Secretary*, Thomas Garson, Grougar, Egilshay, Orkney. Granted 1879.

£3 to Unst Society for five consecutive years.—*Convener and Secretary*, Alex. Sandison, Uyasound, Unst. Granted 1879.

#### SECTION 7.—MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

The Society, being anxious to co-operate with local Associations, will give a limited number of Medium Silver Medals annually to Societies, not on the list of Cattle or Sheep Premiums, in addition to the Money Premiums awarded in the District for—

1. Best Bull, Cow, Heifer of any pure breed, or Ox.
2. Best Stallion, Mare, or Gelding.
3. Best Tup, or Pen of Ewes or Wethers.
4. Best Boar, Sow, or Pig.
5. Best Coops of Poultry.
6. Best sample of any variety of Wool.
7. Best sample of any variety of Seeds.
8. Best managed Farm.
9. Best managed Green Crop.
10. Best managed Hay Crop.
11. Best managed Dairy.
12. Best Sweet Milk Cheese.
13. Best Cured Butter.
14. Best sample of Honey, not less than 5 lbs., taken without destroying the bees.

15. Best collection of Roots.
16. Best kept Fences.
17. Male Farm Servant who has been longest in the same service, and who has proved himself most efficient in his duties, and to have invariably treated the animals under his charge with kindness.
18. Female Servant in charge of Dairy and Poultry who has been longest in the same service, and who has proved herself most efficient in her duties, and to have invariably treated the animals under her charge with kindness.
19. Best Sheep Shearer.
20. Most expert Hedge Cutter.
21. Most expert Labourer at Draining.
22. Most expert Farm-Servant at trial of Reaping Machines.
23. Best Maker of Oat Cakes.

It is left to the local Society to choose out of the foregoing list the classes for which the Medals are to be competed.

The Medals are given for five consecutive years.

#### *Aberdeenshire.*

1. AUCHINDOIR, KILDRUMMIE, AND TOWIE ASSOCIATION.—*Convener*, Carlos P. Gordon of Wardhouse, Inch; *Secretary*, William Walker, Ardhuncart, Mossat. 4 Medals. Granted 1881.
2. CLUNY, MONYMUSE, AND MIDMAR ASSOCIATION.—*Convener*, Ranald Macdonald, Cluny Castle, Aberdeen; *Secretary*, James Christie, Backhill of Castle Fraser, Kemnay, Aberdeen. 2 Medals. Granted 1881.
3. CROMAR, UPPER DEE, AND DONSIDER ASSOCIATION.—*Convener*, Dr Andrew Robertson of Hopewell, Tarland; *Secretary*, William Thomson, Tarland. 4 Medals. Granted 1881.
4. DONSIDER CLUB.—*Convener*, Sir William Forbes of Craigievar, Bart., Fintray House, Aberdeen; *Secretary*, James Rennie, Milltown of Fintray, Aberdeen. 2 Medals. Granted 1877.
5. EBRIDESIDE ASSOCIATION.—*Convener*, Wm. Leask, Skilmafilly, Ellon; *Secretary*, William Hetherwick, Auchnagatt, Ellon. 5 Medals. Granted 1881.
6. FORMARTINE ROOT ASSOCIATION.—*Convener*, Captain Alexander C. Hunter of Tillery, Aberdeen; *Secretary*, Thomas Duguid, Mosshead, Uduy, Aberdeen. 2 Medals. Granted 1879.
7. FYVIE ASSOCIATION.—*Convener*, James Mackie, Lewes, Fyvie; *Secretary*, James Ironside, Steinmanhill, Fyvie. 2 Medals. Granted 1880.
8. GARIOCH TURNIP GROWING ASSOCIATION.—*Convener*, Henry Gordon of Manar, Inverurie; *Secretary*, James Stephen, Conglass, Inverurie. 2 Medals. Granted 1878.
9. INVERURIE ASSOCIATION.—*Convener*, Henry Lumsden of Pitcaple, Pitcaple; *Secretary*, James Stephen, Conglass, Inverurie. 2 Medals. Granted 1878.
10. KINELLAR HORTICULTURAL AND POULTRY ASSOCIATION.—*Convener*, Colonel William Ross King of Tertowie, Kinellar, Aberdeen; *Secretary*, Alexander Taylor, Fichnie, Kinellar, Aberdeen. 2 Medals. Granted 1879.
11. KINNETHMONT ASSOCIATION.—*Convener*, Col. Leith Hay of Rannes, C.B., Leith Hall, Kinnethmont; *Secretary*, William Gerrard, Kinnethmont. 5 Medals. Granted 1881.
12. LEOCHEL-CUSHNIE SOCIETY.—*Convener*, Sir William Forbes of Craigievar, Bart., Fintray House, Aberdeen; *Secretary*, James Strachan, Wester Fowlis, Alford. 3 Medals. Granted 1879.

13. NEW ABERDOUR SOCIETY.—*Convener*, James Cruickshank, Ladysford, Fraserburgh; *Secretary*, Joseph C. Murison, Mill Farm, New Aberdour, Fraserburgh. 5 Medals. Granted 1878.
14. NORTH-EAST ABERDEENSHIRE SOCIETY.—*Convener*, Sir Alexander Anderson, Aberdeen; *Secretary*, G. A. Cruickshank, Nether Cortes, Lonmay. 6 Medals. Granted 1880.
15. NORTH OF SCOTLAND ROOT, VEGETABLE, AND FRUIT ASSOCIATION.—*Convener*, A. F. Nares, Brucktor, Old Meldrum; *Secretary*, James Smith, Inverurie. 2 Medals. Granted 1881.

*Argyllshire.*

16. LISMORE SOCIETY.—*Convener*, Major James Robertson, Glackerisky, Appin; *Secretary*, Dugald M'Intyre, Frackersaig, Lismore, Appin. 2 Medals. Granted 1878.
17. MULL, COLL, AND TREE.—*Convener*, James Noel Forsyth of Quinish, Tobermory; *Secretary*, Robert Lang, Aros Mains, Aros, Mull. 4 Medals. Granted 1880.

*Ayrshire.*

18. ARDROSSAN SOCIETY.—*Convener*, D. Cuninghame, Chapelton, Ardrossan; *Secretary*, James Campbell, Writer, Saltcoats. 2 Medals. Granted 1877.
19. BEITH SOCIETY.—*Convener*, William Bartlemore, County Buildings, Paisley; *Secretary*, William Fulton Love, Writer, Beith, Ayrshire. 2 Medals. Granted 1881.
20. CRAIGIE SOCIETY.—*Convener*, R. Drummond, Pocknave, Craigie, Kilmarnock; *Secretary*, Andrew M'Farlane, Craigie. 3 Medals. Granted 1881.
21. CUMNOCK SOCIETY.—*Convener*, James Murray, jun., Dumfries Arms Hotel, Cumnock; *Secretary*, John Hayman, Dumfries House Mains, Cumnock. 2 Medals. Granted 1877.
22. DALRY SOCIETY.—*Convener*, Andrew Allan, Munnoch, Dalry, Ayr; *Secretary*, Robert Craig, Flashwood, Dalry. 4 Medals. Granted 1879.
23. DUNDONALD SOCIETY.—*Convener*, The Hon. G. R. Vernon, Auchans House, Kilmarnock; *Secretary*, John Caldwell, Bogside, Dundonald. 3 Medals. Granted 1878.
24. GALSTON SOCIETY.—*Convener*, Alex. D. Tait of Milrig, Kilmarnock; *Secretary*, Robert Hendrie, Drumdroch, Galston. 3 Medals. Granted 1877.
25. GALSTON HORTICULTURAL SOCIETY.—*Convener*, Robert Mackie, Loudoun Cottage, Galston; *Secretary*, Thomas Paterson, Galston. 3 Medals. Granted 1880.
26. LOUDOUN AND LANFINE SOCIETY.—*Convener*, Robert Mackie, Loudoun Cottage, Galston; *Secretary*, Andrew Cameron, Newnills, Kilmarnock. 4 Medals. Granted 1879.
27. MUIRKIRK SOCIETY.—*Convener*, Robert Millar, Alloway Cottage, Ayr; *Secretary*, Alexander Donald, The Schoolhouse, Muirkirk. 6 Medals. Granted 1881.
28. NEW CUMNOCK.—*Convener*, John Picken, Mansfield Mains, New Cumnock; *Secretary*, William F. Haddow, Riggfoot, New Cumnock. 4 Medals. Granted 1881.
29. SORN AND DALGAIN SOCIETY.—*Convener*, Graham Somervell of Sorn, Mauchline; *Secretary*, Robert Brown, Dalgain, Sorn, Mauchline. 5 Medals. Granted 1879.
30. STEWARTON SOCIETY.—*Convener and Secretary*, John Lindsay, Thornhill, Stewarton. 2 Medals. Granted 1877.

31. **TARBOLTON SOCIETY.**—*Convener*, W. S. Cooper of Failford, New Club, Edinburgh; *Secretary*, Wm. Candlish, Middlemuir, Tarbolton. 2 Medals. Granted 1878.
32. **WEST KILBRIDE SOCIETY.**—*Convener*, John Crawford, Milstonford, West Kilbride; *Secretary*, Malcolm Logan, Kirkland, West Kilbride. 5 Medals. Granted 1879.

*Banffshire.*

33. **SPEY, AVON, AND FIDDOCHSIDE SOCIETY.**—*Convener*, Sir George Macpherson Grant of Ballindalloch, Bart.; *Secretary*, Wm. Robertson, Aberlour Mains, Craigellachie. 4 Medals. Granted 1877.

34. **BUTE SOCIETY.**—*Convener*, William Barr, Kerrylamont, Rothesay; *Secretary*, John McEwen, 9 Victoria Street, Rothesay. 3 Medals. Granted 1878.

*Dumbartonshire.*

35. **WESTERN DISTRICT OF DUMBARTONSHIRE.**—*Convener*, Sir James Colquhoun of Luss, Bart., Ross-dhu, Luss; *Secretary*, Major James Colquhoun, Ben Cruach Lodge, Arroquhar. 2 Medals. Granted 1879.

*Dumfriesshire.*

36. **MOFFAT AND UPPER ANNANDALE SOCIETY.**—*Convener*, Walter Johnstone, Alton, Moffat; *Secretary*, Alexander Scott, Annandale Estates Office, Moffat. 4 Medals. Granted 1881.
37. **SANQUHAR SOCIETY.**—*Convener*, John Gilchrist Clark of Speddoch, Dabton, Thornhill; *Secretary*, Joseph Carruthers, Sanquhar. 5 Medals. Granted 1878.

*Edinburghshire.*

38. **WESTERN DISTRICT OF MID-LOTHIAN ASSOCIATION.**—*Convener*, James Paterson of Bankton, Mid-Calder; *Secretary*, James H. Steuart, Selms, Kirknewton. 4 Medals. Granted 1878.

*Elginshire.*

39. **FORRES AND NORTHERN FAT CATTLE CLUB.**—*Convener*, Richard H. Harris, Earnhill, Forres; *Secretary*, Robert Urquhart, jun., Forres. 6 Medals. Granted 1881.

*Inverness-shire.*

40. **GLEN URQUHART SOCIETY.**—*Convener*, The Earl of Seafield; *Secretary*, John Kennedy, Pitkerrold, Drumnadrochit. 3 Medals. Granted 1877.
41. **NORTHERN COUNTIES FAT SHOW CLUB.**—*Convener*, Duncan Forbes of Culloden, Inverness; *Secretary*, John Cran, Kirkton, Bunchrew, Inverness. 6 Medals. Granted 1878.
42. **STRATHSPEY CLUB.**—*Convener*, Earl of Seafield, Castle Grant, Grantown; *Secretary*, F. MacBean, Writer, Grantown. 5 Medals. Granted 1881.

*Kincardineshire.*

43. **FETTERCAIRN CLUB.**—*Convener*, Col. McIntroy of The Burn, Brechin; *Secretary*, William Crichton, Castleton of Kincardine, Laurencekirk. 3 Medals. Granted 1878.

*Lanarkshire.*

44. CADDER SOCIETY.—*Convener*, Alexander Campbell, Crosshill, Bishopbriggs; *Secretary*, J. Stewart, 4 Parliamentary Road, Glasgow. 2 Medals. Granted 1877.
45. CALDERWATERHEAD SOCIETY.—*Convener*, Peter Forrest, Shotts; *Secretary*, James Ferguson, Fairnieshaw, Holytown. 2 Medals. Granted 1881.
46. CARNWATH SOCIETY.—*Convener*, Hector F. McLean, Carnwath House; *Secretary*, George Russell, Carnwath. 4 Medals. Granted 1878.
47. CARMICHAEL SOCIETY.—*Convener*, G. R. Paterson, Drumalbin, Thankerton; *Secretary*, John Tweddle, Warrenhill, Thankerton. 2 Medals. Granted 1877.
48. STONEHOUSE ASSOCIATION.—*Convener*, J. P. Alston of Muirburn, Glassford; *Secretary*, William Stevenson, Stonehouse, Lanark. 2 Medals. Granted 1878.

*Orkney.*

49. ROUSAY SOCIETY.—*Convener*, General Burroughs of Rousay, Orkney; *Secretary*, Wm. Seatter, Saviskaill, Rousay. 2 Medals. Granted 1878.

*Perthshire.*

50. CULROSS SOCIETY.—*Convener*, John J. Dalgleish of West Grange; *Secretary*, Wm. Clark, Pitfirrane Estate Office, Dunfermline. 3 Medals. Granted 1879.
51. MIDDLE DISTRICT OF ATHOLE AND TULLYMET.—*Convener*, Wm. Dick of Tullymet, Ballinluig; *Secretary*, John S. Grant, Tullymet, Ballinluig. 1 Medal. Granted 1878.
52. MOULIN ASSOCIATION.—*Convener*, Alexander Forbes, Pitfourie, Pitlochry; *Secretary*, R. M'Gillewie, Balnadrurn, Pitlochry. 1 Medal. Granted 1881.
53. STORMONT UNION SOCIETY.—*Convener*, Sir Alex. Muir Mackenzie of Delvine, Bart; *Secretary*, Robert Grant, The Pleasance, Coupar Angus. 5 Medals. Granted 1880.
54. STRATHEARN ORNITHOLOGICAL SOCIETY.—*Convener*, C. H. Dundas, Gerichrew, Dunim, Crieff; *Secretary*, James M'Laren, jun., Crieff. 2 Medals. Granted 1880.

*Renfrewshire.*

55. EAGLESHAM SOCIETY.—*Convener*, William Gillies, Writer, Pollokshaws; *Secretary*, Wm. Dykes, Polnoon Mains, Eaglesham. 1 Medal. Granted 1878.
56. LOCHWINNOCH SOCIETY.—*Convener*, William Bartlemore, County Buildings, Paisley; *Secretary*, William Logan of Cloak, Writer, Lochwinnoch. 2 Medals. Granted 1881.

*Ross-shire.*

57. BLACK ISLE SOCIETY.—*Convener*, James Fletcher of Rosehaugh, Avoch; *Secretary*, James R. Mitchell, Drynie, Inverness. 6 Medals. Granted 1879 and 1881.
58. WESTER ROSS CLUB.—*Convener*, Sir Kenneth S. Mackenzie of Gairloch, Bart, Conan House, Dingwall; *Secretary*, David Ross, Banker, Dingwall. 4 Medals. Granted 1877.



*Stirlingshire.*

59. CAMPSIE, STRATHBLANE, AND BALDERNOCK SOCIETY.—*Convener*, Sir Charles E. F. Stirling of Glorat, Bart., Milton of Campsie; *Secretary*, James Slimmon, Balcorrach, Campsie. 2 Medals. Granted 1879. •
60. GARGUNNOCK SOCIETY.—*Convener*, Sir Henry J. Seton Stewart of Allanton, Bart., Stirling; *Secretary*, Thomas Leishman, 25 Park Terrace, Stirling. 2 Medals. Granted 1877.
61. KILSYTH SOCIETY.—*Convener*, James Patrick, Queenzieburn, Milton of Campsie; *Secretary*, R. M. Lennox, Victoria Place, Kilsyth. 2 Medals. Granted 1880.

The Medals are given for five consecutive years.

Applications from other Districts must be lodged with the Secretary of the Society by 1st November next.

## RULES OF COMPETITION.

1. All Competitions must be at the instance of a local Society.
2. The classes for which Medals are granted must be in accordance with the list at pages 45 and 46. The Committee shall select the classes, and specify them in the return.
3. In each District the Convener (who must be a member of the Society appointed by the Directors) shall fix the time and place of Competition, appoint the Judges, and make all other necessary arrangements, in concurrence with the other Members of the Society, and the local Association of the District.
4. The Money Premiums given in the District must be £2 for each Medal claimed.
5. The Medal for Sheep Shearing shall not be awarded unless there are three competitors, and it shall always accompany the highest Money Premium. There must not be fewer than two competitors in all the classes.
6. Blank reports will be furnished to all the Conveners of the different Districts. These must, in all details, be completed and lodged with the Secretary *on or before the 1st of November next*, with the exception of green crop reports, which must be forwarded on or before the 20th of December, for the approval of the Directors, against whose decisions there shall be no appeal.
7. When a grant has expired, the District cannot apply again for aid for two years.

## SECTION 8.—PLOUGHING COMPETITIONS.

The Minor Silver Medal will be given to the winner of the first or highest Premium at Ploughing Competitions, provided a Report in the following terms is made to the Secretary, within one month of the Competition, by a Member of the Society:—

## FORM OF REPORT.

I of Member of the Highland and Agricultural Society, hereby certify that I attended the Ploughing Match of the Association at in the county of on the when ploughs competed; of land was assigned to each, and hours were allowed for the execution of the work. The sum of £ was awarded in the following proportions, viz. :—  
[Here enumerate the names and designations of successful Competitors.]

## RULES OF COMPETITION.

1. All Matches must be at the instance of a local Society or Ploughing Association, and no Match at the instance of an individual, or confined to the tenants of one estate, will be recognised.

2. The title of such Society or Association, together with the name and address of the Secretary, must be registered with the Secretary of the Highland and Agricultural Society, 3 George IV. Bridge, Edinburgh.

3. Not more than one Match in the same season can take place within the bounds of the same Society or Association.

4. All reports must be lodged within one month of the date of the Match, and certified by a Member of the Highland and Agricultural Society who was present at it.

5. A Member can only report one Match, and a Ploughman cannot carry more than three Medals in the same season.

6. To warrant the grant of the Medal there must have been twelve ploughs in Competition, and Three Pounds awarded in Premiums by the local Society. The Medal to be given to the winner of the first or highest prize.

7. Ploughmen shall not be allowed any assistance, and their work must not be set up nor touched by others; on land of average tenacity the ploughing should be at the rate of an imperial acre in ten hours, and attention should be given to the firmness and sufficiency of the work below, more than to its neatness above the surface.

## CLASS III.

### COTTAGES AND GARDENS.

The following Premiums are offered for Competition in the Parishes after mentioned.

The Premiums for Cottages and Gardens are given for five consecutive years.

#### SECTION I.—PREMIUMS FOR BEST KEPT COTTAGES AND GARDENS.

1. Best kept Cottage—One Pound ; and where there are four Competitors—Minor Silver Medal.  
Second best—Ten Shillings.  
Third best—Minor Silver Medal.
2. Best kept Cottage Garden—One Pound ; and where there are four Competitors—Minor Silver Medal.  
Second best—Ten Shillings.  
Third best—Minor Silver Medal.

#### *Aberdeenshire.*

1. METHLICK HORTICULTURAL SOCIETY.—*Convener*, John Grant, Banker, Methlick ; *Secretary*, James Allan, Methlick. Granted 1877.

#### *Argyllshire.*

2. OBAN.—*Convener*, Neil Macdonald of Dunach, Oban ; *Secretary*, Donald Macgregor, Solicitor, Oban. Granted 1880.

#### *Dumbartonshire.*

3. CARDROSS.—*Secretary*, Mrs Murray, Moore Park, Cardross. Granted 1881.

#### *Edinburghshire.*

4. CALDERS UNION HORTICULTURAL SOCIETY.—*Convener*, R. G. Smith, Georgeville, Mid-Calder ; *Secretary*, James B. Smith, Greenloan Cottage, Kirknewton. Granted 1878.
5. CURRIE AND BALERNO.—*Convener*, Sir James H. Gibson-Craig of Riccarton, Bart., Currie ; *Secretary*, Alexander Maltman, Rosebank, Currie. Granted 1881.

#### *Fifeshire.*

6. NORTH OF FIFE HORTICULTURAL SOCIETY.—*Convener*, John Mitchell, Fliskmillan, Cupar Fife ; *Secretary*, George Leslie, Luthrie, Cupar Fife. Granted 1878.

#### *Kincardineshire.*

7. MEARNS AMATEUR HORTICULTURAL SOCIETY.—*Convener*, D. A. Pearson of Johnston, Laurencekirk ; *Secretary*, James Burgess, Laurencekirk. Granted 1878.

*Lanarkshire.*

8. **ABINGTON FLORAL AND HORTICULTURAL SOCIETY.**—*Convener*, John Morton, Nether Abington, Abington; *Secretary*, Matthew M'Kendrick, Abington. Granted 1881.

*Linlithgowshire.*

9. **DALMENY AND QUEENSFERRY HORTICULTURAL SOCIETY.**—*Convener*, Peter Glendinning, Leuchold, Dalmeny Park, Edinburgh; *Secretary*, John Allan, Dalmeny Park, Edinburgh. Granted 1879.

*Perthshire.*

10. **BRACO HORTICULTURAL SOCIETY.**—*Convener*, John Kinross, Gannochan, Braco; *Secretary*, George Dingwall, Ardoch Gardens, Braco. Granted 1878.
11. **DUNNING HORTICULTURAL SOCIETY.**—*Convener*, James Fenwick, Lead-ketty, Dunning; *Secretary*, Johnstone Wright, Dunning. Granted 1880.
12. **FORGANDENNY.**—*Convener*, T. T. Oliphant of Rossie, Queen Marys, St Andrews; *Secretary*, A. M. Nicholson, Craigbank, Forgandenny, Bridge of Earn. Granted 1877.
13. **MUTHILL HORTICULTURAL SOCIETY.**—*Convener*, Henry Curr, Pitkellony, Muthill; *Secretary*, Malcolm Finlayson, Pitkellony Office, Muthill. Granted 1877.

*Ross-shire.*

14. **WESTER ROSS HORTICULTURAL SOCIETY.**—*Convener*, Sir Kenneth S. Mackenzie of Gairloch, Bart.; *Secretary*, David Munro, 65 High Street, Dingwall. Granted 1881.

*Stirlingshire.*

15. **KILLEARN SOCIETY.**—*Convener*, David Edmond of Ballochruin, Balfron; *Secretary*, John M'Intyre, Kirkhouse, Killearn. Granted 1879.

*Sutherlandshire.*

16. **SKIBO ASSOCIATION.**—*Convener*, Evan C. Sutherland Walker of Skibo, Skibo Castle, Sutherland. Granted 1879.

*Wigtownshire.*

17. **INCH.**—*Convener*, Earl of Stair, K.T., Lochinch, Castle Kennedy, Wigtownshire; *Secretary*, Thomas C. Greig, Rephad, Stranraer. Granted 1879.

## RULES OF COMPETITION.

1. Competitions may take place in the different parishes for Cottages and Gardens, or for either separately.

2. The occupiers of Lodges at Gentlemen's Approach Gates and Gardener's Houses are excluded, as well as others whom the Committee consider, from their position, not to be entitled to compete. The inspection must be completed by the 1st of October. In making the inspection, the Conveners may take the assistance of any competent judges.

3. It is left to the Committee of the district to regulate the maximum annual rent of the Cottages, which may, with the garden, be from £5 to £7.

4. A person who has gained the highest Premium cannot compete again, but will be entitled to a Medal if certified by the Committee to be equal in merit to the first on the list of Competitors.

5. If the Cottage is occupied by the proprietor, the roof must be in good repair; if the roof is thatch, it must be in good repair, though in the occupation of a tenant. The interior and external conveniences must be clean and orderly—the windows must be free of broken glass, clean, and affording the means of ventilation. Dung-hills, and all other nuisances, must be removed from the front and gables. In awarding the Cottage Premiums, preference will be given to Competitors who, in addition to the above requisites, have displayed the greatest taste in ornamenting the exterior of their houses, and the ground in front and at the gables.

6. In estimating the claims for the Garden Premiums, the judges should have in view:—The sufficiency and neatness of the fences and walks; the cleanness of the ground; the quality and choice of the crops; and the general productiveness of the garden.

7. Reports, stating the number of Competitors, the names of successful parties, and the nature of the exertions which have been made by them, must be transmitted by the Conveners to the Secretary *on or before the 1st November next*.

8. When a grant has expired, the District cannot apply again for aid for two years.

Parishes desirous of these Premiums must lodge applications with the Secretary *on or before the 1st November next*.

## SECTION 2.—MEDALS FOR COTTAGES AND GARDENS OR GARDEN PRODUCE.

The Society will issue annually two Medium Silver Medals to a limited number of local Associations or individuals, who at their own expense establish Premiums for Cottages or Gardens under £15 of Rent. The Medals may be awarded for best kept Cottage, and best kept Garden or Flower Plot, or Garden Produce.

Local Associations or individuals desirous of these Medals, must lodge applications with the Secretary *on or before the 1st November next*. The Medals are given for five consecutive years.

1. UDNY HORTICULTURAL SOCIETY.—*Convener*, Alexander Keith, Chapelton, Ellon; *Secretary*, Thomas Duguid, Ardmore, Udney. 2 Medals. Granted 1881.

### *Ayrshire.*

2. GALSTON HORTICULTURAL SOCIETY.—*Convener*, Robert Mackie, Loudoun Cottage, Galston; *Secretary*, Thomas Paterson, Galston. 2 Medals. Granted 1881.

### *Dumbartonshire.*

3. VALE OF LEVEN AND DUMBARTON HORTICULTURAL SOCIETY.—*Convener*, J. M. Martin, yr. of Auchendennan, Bloomhill, Cardross; *Secretary*, Robert Warnock, 88 Bridge Street, Alexandria, N.B. Granted 1879.

*Fifeshire.*

4. DYSART HORTICULTURAL SOCIETY.—*Convener*, James T. Oswald of Dupnikier, Kirkcaldy; *Secretary*, Alexander Justice, Sinclairton, Kirkcaldy. Granted 1877.
5. KIRKCALDY HORTICULTURAL SOCIETY.—*Convener*, William Drysdale of Kilrie, Kinghorn; *Secretary*, John Leslie, West Mills, Kirkcaldy. Granted 1880.

*Lanarkshire.*

6. ALBERT GARDENS ASSOCIATION, GLASGOW.—*Secretary*, George D. Miller, 16 Mathieson Street, Glasgow. Granted 1877.
7. BOTHWELL HORTICULTURAL SOCIETY.—*Convener*, Dr Bruce Goff, Woodlea, Bothwell; *Secretary*, Robert Horne, Schoolhouse, Bothwell. Granted 1876. (In abeyance in 1880.)
8. CARNWATH HORTICULTURAL SOCIETY.—*Convener*, George Russell, Carnwath; *Secretary*, David Aitken, Carnwath. Granted 1880.
9. GARTSHERRIE WORKS HORTICULTURAL SOCIETY.—*Secretary*, Robert Thom, 1 Southpark Cottage, Bellshill. 2 Medals. Granted 1881.
10. NEW VICTORIA GARDENS, LILY BANK ROAD, GLASGOW.—*Secretary*, James Walker, 86 Ardgowan Street, Glasgow. Granted 1878. (One year in abeyance.)
11. SARACEN PUBLIC GARDENS, POSSIL PARK, GLASGOW.—*Convener*, Walter Macfarlane, 22 Park Circus, Glasgow; *Secretary*, William Manson, 348 Saracen Street, Possil Park, Glasgow. Granted 1879.
12. SHETTLESTON HORTICULTURAL SOCIETY.—*Secretary*, James Dickson, 144 Main Street, Tollcross, Glasgow. 2 Medals. Granted 1881.

*Nairnshire.*

13. AULDEARN FLOWER SHOW.—*Convener*, Hugh Brodie of Brodie, Brodie Castle, Forbes; *Secretary*, James Carson, Auldearn, Nairn. Granted 1880.

*Perthshire.*

14. BLAIRGOWRIE AND RATTRAY HORTICULTURAL SOCIETY.—*Convener*, John Anderson, Royal Hotel, Blairgowrie; *Secretary*, Henry Dryer, Croft House, Blairgowrie. Granted 1880.
15. BREADALBANE, WEEM, STRATHTAY, AND GRANDTULLY HORTICULTURAL SOCIETY.—*Convener*, E. O. Douglas of Killiechassie, Aberfeldy; *Joint-Secretaries*, D. Macdiarmid, Bank of Scotland, Aberfeldy, and Peter Haggart, Keltneyburn, Aberfeldy. Granted 1879.
16. DUNKELD AND BIRNAM HORTICULTURAL AND POULTRY ASSOCIATION.—*Convener*, John Macgregor, Ladywell, Dunkeld; *Secretary*, Robert Robertson, Ladywell, Dunkeld. Granted 1880.
17. LOGIEALMOND AND GLENALMOND HORTICULTURAL SOCIETY.—*Convener*, Grème R. Mercer of Gorthie, Glen Tulchan House, Perth; *Secretary*, Daniel Paton, Harrietfield, Perth. Granted 1878.

## REGULATIONS.

1. Competitions may take place in the different districts for Cottages and Gardens, or for either separately.
2. The annual value of each Cottage, with the ground occupied in the parish by a Competitor, must not exceed £15.
3. If Competition takes place for Garden Produce in place of the best kept Garden, such produce must be *bona fide* grown in the Exhibitor's

Garden, and he will not be allowed to make up a collection from any other Garden.

4. Blank reports will be furnished to the Conveners and Secretaries of the different Districts. These must, in all details, be completed and lodged with the Secretary *on or before the 1st November next*, for the approval of the Directors, against whose decisions there shall be no appeal.

5. When a grant has expired, the District cannot apply again for aid for two years.

### SECTION 3.—IMPROVING EXISTING COTTAGES.

To the Proprietor in Scotland who shall report the Improvement of the greatest number of Cottages during the years 1878, 1879, and 1880—The Gold Medal.

### SECTION 4.—BUILDING NEW COTTAGES.

To the Proprietor in Scotland who shall report the Erection of the greatest number of approved Cottages during the years 1877, 1878, 1879, and 1880—The Gold Medal.

#### RULES OF COMPETITION.

1. Claims for the Premiums Nos. 3 and 4 must be lodged with the Secretary on or before the 1st of October next, to allow an inspection to be made of the different Cottages. The inspection will be conducted by a Committee of the Society's Members, and Reports must be transmitted to the Secretary *on or before the 1st November next*.

2. The annual value of the Cottage or Cottages separately, with the garden ground, must not exceed £5.

3. In estimating the claims of the Competitors, the following points will be kept in view :—The external appearance of the Cottages ; their internal accommodation ; the arrangements of the out-houses ; the means of drainage and ventilation ; and the expense of the building or of the alteration, compared with its durability and accommodation. When the Cottages of one Competitor are superior in style and comfort to those of another, though not so numerous, the Inspectors will give them preference, provided they amount at least to three, and have been erected at a moderate expense.

4. Parties competing will forward to the Society Plans, Specifications, and Estimates, of which, and of all information sent therewith, copies may be taken for publication, if the Society shall see fit, and the originals returned to the parties within six months, if desired.

# HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

## GENERAL SHOW OF STOCK AND IMPLEMENTS

AT

### STIRLING

ON 26TH, 27TH, 28TH, AND 29TH JULY 1881.

President of the Society.

HIS GRACE THE DUKE OF RICHMOND AND GORDON, K.G.

Chairman of the Local Committee.

SIR JAMES R. GIBSON-MAITLAND OF CLIFTON HALL, BART.

The District connected with the Show comprises the Counties of Stirling, Dumbarton, and Clackmannan, and the Western Division of Perthshire.

## REGULATIONS.

### GENERAL CONDITIONS.

1. The Competition is open to Exhibitors from all parts of the United Kingdom.
2. Every Lot must be intimated by a Certificate of Entry, lodged with the Secretary *not later than the 3d of June for Implements, and 10th of June for Stock and other Entries*. Printed forms will be issued on application to the Secretary, No. 3 George IV. Bridge, Edinburgh. Admission Orders will be forwarded to Exhibitors, by post, previous to the Show.
3. Protests against the awards of the Judges must be lodged with the Secretary not later than 9 A.M. on Wednesday, 27th July, and parties must be in attendance at the Committee-Room, in the Show-Yard, at 10 A.M. that day, when protests will be disposed of.
4. Protests lodged for causes which the protestor produces no good evidence to substantiate, will render him liable to be reported to the Board of Directors, with the view, if they see reason, to his being prohibited from again entering stock for a General Show.
5. The Society shall not be liable for any loss or damage which Stock, Poultry, Implements, or other articles may sustain at the Show, or in transit.
6. The decisions of the Board of Directors are final in all questions respecting Premiums and all other matters connected with the Show, and it shall not be competent for any Exhibitor to appeal against such decisions to, nor seek redress in respect of them from, any other tribunal.
7. Covered Booths for Offices (9 feet by 9 feet), purely for business, not for exhibition of goods, can be had for £3, 10s. to Members, and £5 to Non-Members. Intimation to be made to the Secretary before the 1st of July.
8. No lights allowed in the Yard at night, and Smoking is strictly prohibited within the sheds. Those infringing this Rule will be fined 10s.
9. As the command of water in the Yard is limited, it is particularly requested that waste be avoided.
10. When the ground requires to be broken, the turf must be carefully lifted and laid aside, and the surface must be restored to the satisfaction of the Society, and at the expense of the Exhibitor.
11. All persons admitted into the Show-Yard shall be subject to the Rules and Orders of the Directors.
12. The violation by an Exhibitor of any one of the Regulations will involve the forfeiture of all Premiums awarded to him, or of such a portion as the Directors may ordain.



13. Railway Passes for unsold stock and implements must be applied for at the Committee Room in the Yard between 9 and 11 o'clock on the forenoon of Thursday and Friday.

14. The Show terminates at 5 p.m. on Friday, 29th July, and no animals or article can be withdrawn before that hour. Stock and Implements may remain in the Yard till Saturday afternoon.

15. The Premiums awarded will be paid in November 1881, and, with the exception of the Tweeddale Gold Medal and the Silver Medals, may be taken either in money or in plate.

#### STOCK AND POULTRY.

16. Stock and Poultry to be entered with the Secretary on or before the 10th day of June. Received in the Yard on Monday, 25th, and till 10 A.M. on Tuesday, 26th July. Judged at 11 A.M. on Tuesday. Exhibited on Tuesday, Wednesday, Thursday, and Friday, 26th, 27th, 28th, and 29th July.

17. All animals must be entered in the sections applicable to their ages, and cannot be withdrawn after entry.

18. No animal to be allowed to compete in more than one section, except Horses in Sections 13, 14, and 15, which may be also entered in Section 16.

19. Shorthorn and Galloway animals must be entered in the herd books, or the exhibitor must produce evidence that his animal is eligible to be entered therein.

20. Stock must be *bona fide the property and in the possession of the Exhibitor* from the 10th June (the last day of Entry).

21. The schedule of Entry must be filled up so far as within the knowledge of the Exhibitor.

22. The name of the Breeder, if known, must be given, and if the Breeder is not known a declaration to that effect, signed by the Exhibitor, must be sent along with the Schedule, and no pedigree will be entered in the Catalogue when the Breeder is unknown.

23. Should it be proved to the satisfaction of the Directors that an animal has been entered under a false name, pedigree, or description, for the purpose of misleading the Directors or Judges as to its qualification or properties, the case shall be reported to the first General Meeting, in order that the Exhibitor shall be disqualified from again competing at the Society's Shows, and his name, if he be a Member, struck from the roll, or his case otherwise disposed of as the Directors may determine.

24. An animal which has gained a first premium at a General Show of the Society cannot again compete in the same section.

25. When an animal has previously been disqualified by the decision of any Agricultural Association in Great Britain or Ireland, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail to state it, and the grounds thereof, in his entry, to enable the Directors to judge of its validity.

26. Breeding Stock must not be shown in an improper state of fatness, and the Judges will be prohibited from awarding Premiums to overfed animals.

27. No animal shall bear on its rug, harness, pail, or other fittings, any initial, crest, or mark of ownership, nor be distinguished otherwise than by the number indicating its place in the Catalogue.

28. Any artificial contrivance or device of any description found on an animal either for preventing the flow of milk or for any other purpose, will disqualify that animal from being awarded a Premium, and the Owner of said animal will be prohibited from again entering stock for any of the Society's General Shows, or for such a period as the Directors may see fit.

29. Exhibitors shall be answerable for all acts, whether committed by themselves, their servants, or others, and shall be responsible for the condition of their animals during the whole time they remain in the Show-Yard.

30. No animal to be taken out of its stall after 10 A.M. during the Show, except by order of the Judges, or with permission of the Secretary. Those infringing this Rule will be fined 10s.

31. Aged Bulls and Stallions must have had produce, and, along with Two-year-old Bulls, Three-year-old Colts, and aged Tups have served within the year of the Show.

32. All Cows must have had calves previous to the Show, and when exhibited, they must either be in milk or in calf; if in milk, birth must have been within 9 months of the Show; if in calf, birth must be certified within 9 months after the Show. In the case of Ayrshire Heifers in Calf, calved before 1st January 1879, birth must be certified within 9 months after the Show.

33. All Milch Cows must have been milked dry the evening previous to being judged, and they must, while within the Show-Yard, be milked morning and evening. The Judges will be instructed to withhold the prizes from any animals overstrained or suffering from want of being milked.

34. Ayrshire Cows in milk will be inspected by Veterinary Surgeons appointed by the Directors before the judging commences, and those Cows found over strained from excess of milk will be prevented from being placed before the Judges.

35. Two-year-old Heifers—of the Short-horn and Polled Breeds—must be in calf when exhibited, and the premiums will be withheld till birth be certified, which must be within 9 months after the Show. Animals of any age that have had a calf must be shown as Cows.

36. Mares in Sections 5 and 12 must have produced foals after 1st January 1881, and foals must be at foot, except when death can be proved. Mares in Section 6 must be in foal, and awards will be suspended till birth is certified, which must be within 11 months from the date of the Show.

37. With reference to regulations 33 and 35, birth of at least a seven months' calf must be certified; and in regard to regulation 36, birth of at least a nine months' foal.

38. Horses entered as suitable for Field are expected to be jumped in the Horse Ring, but this is not compulsory except when the animals are being judged, and then only if required by the Judges. Those entered for leaping must be jumped in the Horse-Ring at each Parade during the Show. Those refusing will be liable to a penalty of 10s. each Parade.

39. The inspection of Horses as to soundness is left entirely to the Judges, who may consult the Society's Veterinary Surgeon if they deem it expedient.

40. No protests on veterinary grounds will be received.

41. All Ewes must have reared Lambs in 1881; and Ewes in Sections 3 and 8 (Blackfaced and Cheviot) must be in milk, and have their Lambs at foot.

42. Sheep must have been clipped bare during the season, and the Judges are instructed to examine the fleeces of the Sheep selected for prizes, and to cast those on which they find any of the former fleece. Fleeces must not be artificially coloured.

43. Sows must have reared pigs in 1881, or be in pig; and Pigs must belong to the same litter, and be uncut.

44. In Poultry the Aged Birds must have been hatched previous to, and Cockerels and Pullets in, 1881. No dubbing is allowed in the male birds of the Game Breeds. In the sections for Ducks, Turkeys, Geese, and Hens and Pullets of the Game and Malay Breeds, the lots to consist of one bird only.

45. The Yard will be open for Stock on Monday, 25th July, and between Six and Ten o'clock on the morning of Tuesday, 26th, after which hour no Stock can be admitted.

46. Bulls must be secured by nose rings, with chains or ropes attached, or with strong halters and double ropes. All cattle must be tied in their stalls.

47. Servants in charge of Stock must bring their own buckets or pails, and a piece of rope to carry their forage.

48. Strong loose boxes will be provided for Stallions and three and two-year old Entire Colts, in which they can remain all night, and loose boxes for Mares with foal at foot; closed-in stables for all the other horses, and covered

accommodation for the whole of the other stock. Night accommodation will be provided for Attendants on Stock, and those requiring the same must make application when they return their Entry Schedules, and remit the charge along with their stall rent.

49. Straw, hay, grass, and tares will be provided free by the Society during the four days of the Show; other kinds of food will be supplied at fixed prices in the forage yard. Any Servant removing bedding from an adjoining stall will be fined in double the amount taken. Exhibitors may fetch their own cake or corn to the Yard, but not grass, tares, hay, nor straw. Coops, food, and attendance for Poultry will be found by the Society.

50. Cattle, Sheep, Swine, or Poultry cannot be removed from the Yard till 5 p.m. on Friday, 29th July, except on certificate by the Veterinary Surgeon employed by the Directors.

51. Horses may be withdrawn at 6 o'clock each evening on a deposit of £2 for each animal, which shall be forfeited if the animal is not brought back. They must return at half-past 7 o'clock the following morning, and those not in before 8 will forfeit 10s. Horse passes to be applied for at the Committee Room between 5 and 6 p.m. on Tuesday, and the deposit will be returned between 12.30 and 2.30 on Friday.

52. When the Stock is leaving the Yard, no animal is to be moved till ordered by those in charge of clearing the Yard. Those transgressing this Rule will be detained till all the other Stock is removed.

#### JUDGING STOCK AND POULTRY.

53. On Tuesday, 26th July, Exhibitors, and all others except Servants in charge of Stock, must leave the Yard at 10 a.m.

54. The Judges will commence their inspection at 11 a.m., when the public will be admitted. The space reserved for the Judges will be enclosed by ropes, and no encroachment will be permitted. In no case shall a Premium be awarded unless the Judges deem the animals to have sufficient merit; and where only one or two lots are presented in a section, and the Judges consider them unworthy of the premiums offered, it shall be in their power to award a lower prize, or to suggest the removal of any lot which appears to them unworthy of being placed in the Yard.

55. In addition to the Premiums, the Judges are authorised to award three Commendations in each section (except Poultry, where only two prizes are to be awarded) if the entries are numerous and the animals of sufficient merit. These Commendations to consist of—Very Highly Commended, Highly Commended, and Commended.

56. The animals in Sections 10 and 11 (Ayrshire Breed) which have not calved before the Show will be judged along with Cows in Calf, and those in Section 12 which have calved before the Show will be judged along with Cows in Milk.

57. Two Members of Committee will attend each Section of the Judges. It will be their duty to see that no obstruction is offered to them, and that the space reserved for them is not encroached on; to communicate to the Secretary any question that may arise for the consideration of the Committee; to complete their reports; and to ticket the prize animals.

58. It shall not be competent for any Exhibitor, nor for his Factor or Land-Steward, to act as a Judge or Attending Member in any class in which he is competing; and no Exhibitor shall remain in charge of any lot, whether belonging to himself or another, while the Judges are at work in the Yard.

#### COLLIE DOGS.

59. Collie Dogs to be entered with the Secretary on or before 10th June. Received in the Showyard on Monday 25th July, and till 10 a.m. on Tuesday 26th July. Judged at 11 a.m. on Tuesday. Exhibited Tuesday, Wednesday, Thursday, and Friday, 26th, 27th, 28th, and 29th July.

60. Collies must each have a collar and chain. They will be fed by the

Society and may be taken out at night on deposit of £1, which will be returned at the termination of the Show.

### STALL RENT.

31. The following rates shall be paid by Exhibitors when making their Entries:—

	Members.		Non-Members.	
	s.	d.	s.	d.
Cattle, each, . . . . .	15	0	25	0
Loose boxes for Stallions—3 and 2 year old entire Colts, and Mares with Foals at foot,	30	0	40	0
All other Horses, each, . . . . .	20	0	30	0
Sheep, per pen, . . . . .	10	0	15	0
Swine, per pen, . . . . .	15	0	20	0
Poultry, each entry, . . . . .	3	0	5	0
Collie Dogs, each, . . . . .	3	0	5	0
Night accommodation for Attendants, each, .	10	0	12	0
Covered Booths for offices, 9 feet by 9 feet, .	70	0	100	0
Newspaper offices, . . . . .	£2, 10s.			

### IMPLEMENTS AND OTHER ARTICLES.

62. Implements to be entered with the Secretary on or before 3d June. Received in the Yard on Tuesday, 19th July, and till ten o'clock on the morning of Tuesday, 26th July. Exhibited Tuesday, Wednesday, Thursday, and Friday, 26th, 27th, 28th, and 29th July.

63. No Money Prizes or Medals will be given for Implements of any kind, and no inspection of them by Judges will take place, except those specified at p. 15.

64. Agricultural Implements, and Implements and collections of articles not Agricultural, will be received for Exhibition, but the Secretary will be entitled to refuse Entries from dealers in articles not deemed worthy of Exhibition.

65. Implements will be placed in the following sections, the Exhibitors' names being in alphabetical order, viz.:—1st, Under cover; 2d, Open; 3d, Under cover, for articles not in motion belonging to Exhibitors in motion yard; 4th, Motion yard; 5th, Under cover for exhibits not agricultural to be entered as such, and special arrangements made with the Secretary. Exhibitors must intimate in which section their Exhibits are to be placed, and specify the space they require.

66. The articles of each Exhibitor will be all placed in one stand, except implements in motion, and must not on any account extend beyond the width allowed. No article to be moved out of its stand, or the stand dismantled, till the termination of the Show, at 5 p.m. on Friday, 29th July. Those infringing this rule will be reported to the Directors.

67. Exhibitors must arrange their own articles *within* the space allotted to them before 11 o'clock on Tuesday the 26th July, and to the satisfaction of those in charge of the Implement Yard.

68. Exhibitors must on no account leave their stands during the judging of Stock, and if found in the Stock Yard they will be fined 10s.

69. All Machines requiring steam or fire must be entered as such in the Certificate, and will be placed in the Motion Yard. Coke must be used in all cases where fire is required.

70. No Steam Engine shall be driven in the Yard at a greater speed than 6 miles an hour.

71. Locomotive and Traction Engines and other Machines must not be moved from their places without permission of the Secretary, and must not be moved from their stands till 5.30 p.m. on Friday.

72. There must be attached to each Implement, when forwarded to the Show, a label bearing the Exhibitor's name, and that of the implement.

73. The carriage of all Implements must be prepaid.

## GENERAL SHOW AT STIRLING IN 1881.

### STALL RENT.

74. No smaller space than 6 feet frontage, 20 feet deep (in Motion Yard 50 feet deep), can be allowed for Implements, and, except for exhibits not agricultural, no boarding shall exceed 4 feet in height.

75. Implement Exhibitors who are Members of the Society are entitled to either 20 feet by 20 feet of open space free; or in Motion Yard 8 feet by 50 feet of open space free; for additional space the charge is as follows:—

	Members.	Non-Members.
Implement Shedding, 20 feet deep, per foot . . .	£0 3 0	£0 4 0
Implements without Shedding, 20 feet deep, per foot . . .	0 1 0	0 2 0
Implement Shedding in Motion Yard, 20 feet deep with 30 feet open space behind . . .	0 4 6	0 7
Implements in Motion Yard, without shedding, 50 feet deep, per foot . . .	0 2 6	0 5 0
Covered Booths for offices, 9 feet by 9 feet . . .	3 10 0	5 0 0
Newspaper offices . . .	£2, 10s.	

### ADMISSION TO YARD.

The public will be admitted on Tuesday, 26th July, at 11 A.M., when the inspection by the Judges commences. The charges will be—Tuesday, from 11 A.M. till 5 P.M., 5s; Wednesday, from 8 A.M. till 5 P.M., 2s. 6d.; Thursday, from 8 A.M. till 5 P.M., 1s.; Friday, from 8 A.M. till 5 P.M. 6d.

Members of the Society are admitted to the Show-Yard without payment, on exhibiting a "*Member's Ticket*," which is strictly not transferable. Tickets will be sent to all Members residing in the Counties connected with the Show. Members residing in other localities must apply for Tickets at the Secretary's Office, 3 George IV. Bridge, Edinburgh, *before the 16th of July*.

Exhibitors of Stock (not Members) will be charged 5s. for admission to the judging on Tuesday; on Wednesday at 8 A.M., and throughout the Show they will be admitted free.

Exhibitors of Implements and their attendants will be entitled to free entry during the Show, but must remain at their stalls during the judging of the Stock on Tuesday.

Tickets for attendants on Stock and Implements are not available to admit to the Yard between 11 A.M. and 5 P.M.; and any attendant requiring to leave the Yard during the day, cannot be again admitted except by a special pass (to be applied for at the Committee Room), which must be given up on his return.

Placards are prohibited both inside the Show-Yard and on the outside of the Boundary Fence, with the exception of those belonging to Exhibitors, whose right is confined to their own stalls. No newspapers or any other article allowed to be carried about the Yard for sale. No strolling bands admitted.

*No Carriages or Equestrians admitted without special leave from the Directors, and then only for Invalids. Bath chairs may be brought in.*

Premium Lists, Regulations, and Certificates of Entry, may be obtained by applying at the Secretary's Office, No. 3 George IV. Bridge, Edinburgh.

*All Communications should be addressed to FLETCHER NORTON MENZIES, Esq., Secretary of the Highland and Agricultural Society of Scotland, No. 3 George IV. Bridge, Edinburgh.*

### LAST DAYS OF ENTRY.

IMPLEMENTS—FRIDAY, 3D JUNE.

STOCK AND ALL OTHER ENTRIES—FRIDAY, 10TH JUNE.

## RAILWAY ARRANGEMENTS.

The Caledonian, North British, and Glasgow and South-Western Railway Companies have adopted the following regulations:—

1. Stock and Implements to the Show to be charged full rates.
2. From the Show, if sold, full rates.
3. From the Show, if unsold, to be conveyed back at one-half the ordinary charge to the station whence they were sent, on production of a certificate from the Secretary of the Show, to the effect that they are really unsold. *This Regulation applies only if the Traffic is conveyed by Goods Trains, there being no reduction in the rates when it is conveyed by Passenger Trains.*
4. HORSES—By Passenger or Special Train.
  - (a) A Stallion to be charged the rate for one Horse, plus 50 per cent.
  - (b) Any other Horse, for which the exclusive use of a horse-box is ordered, to be charged the rate for one Horse, plus 50 per cent.
  - (c) Other Horses to be charged at ordinary rates.
5. BULLS, COWS, AND OTHER ANIMALS—
  - (a) A Bull, Cow, or other animal sent in a horse-box, and for which the exclusive use of the box has been ordered, to be charged the rate for three Horses.
  - (b) Bulls, Cows, or other animals sent in horse-boxes, but for which the exclusive use of the box has not been ordered, to be charged each the rate for one Horse, plus 50 per cent.
6. Poultry.—The Companies give notice that they are not common carriers of poultry; they will, however, to accommodate the public, carry such by special agreement only, and at special rates, to be obtained at the Companies' stations.
7. Dogs to be charged full rates both ways.
8. All the above to be carried at owners' risk.
9. Collection and Delivery to be performed in all cases by the owners.

The Highland and Great North of Scotland Railway Companies have adopted the following Clearing-House Regulations.—

1. Stock and implements to the Show to be charged full rates.
2. From the Show, if sold, full rates.
3. From the Show, if unsold, to be conveyed at *half rates* back to the station whence they were sent, on production of a certificate from the Secretary of the Agricultural Show to the effect that they are really unsold.
4. All the above to be carried at owners' risk.
5. When agricultural machines and implements are carried under these regulations to and from Shows, they must be invoiced station to station at the ordinary rates. Collection and delivery at sending station, and delivery to, or collection from, the Show-Yard to be performed by, or at the expense of the owners.
6. Regulations Nos. 1, 2, and 3, as to Cattle and Horses, to apply only if the traffic be conveyed in Cattle Waggon and by Goods Trains.
7. Poultry and Dogs to be charged full rates both ways.
8. No reduction in the ordinary rates for Horses or Cattle when conveyed in Horse-boxes.
9. Parties requiring the exclusive use of a Horse-box for only one animal to be charged one fare and a half.

The North-Eastern Railway Company has adopted the above Clearing-House Regulations, except No. 9, which they have altered as follows:—  
'If three stalls be occupied, or if the exclusive use of a box be ordered, 25 per cent. beyond the ordinary charge for three horses.'

## PREMIUMS.

THE TWEEDDALE GOLD MEDAL, value £20, will be given for the best Shorthorn Bull in the Yard. All former Prize Animals are eligible to compete.

In addition to the Premiums, the Judges are authorised to award three Commendations in each section (except Poultry, where only two prizes are to be awarded) if the entries are numerous, and the animals of sufficient merit. These Commendations to consist of—Very Highly Commended, Highly Commended, and Commended.

## CLASS I.—CATTLE.

Section	SHORTHORN.*	Premiums.		
		1st.	2d.	3d.
		£	£	£
1.	Bull calved before 1st Jan. 1879, .	25	12	6
	Breeder of best Bull, The Silver Medal.			
2.	Bull calved on or after 1st Jan. 1879, .	25	12	6
3.	Bull calved on or after 1st Jan. 1880, .	12	6	3
4.	Cow of any age, .	20	10	5
5.	Heifer calved on or after 1st Jan. 1879, .	12	6	3
6.	Heifer calved on or after 1st Jan. 1880, .	10	5	3
		<hr/>		
				£181
	AYRSHIRE.			
7.	Bull calved before 1st Jan. 1879, .	20	10	5
	Breeder of best Bull,—The Silver Medal.			
8.	Bull calved on or after 1st Jan. 1879, .	20	10	5
9.	Bull calved on or after 1st Jan. 1880, .	10	5	3
10.	Cow in Milk, calved before 1st Jan. 1878, .	15	8	4
11.	Cow in Milk calved on or after 1st Jan. 1878, .	15	8	4
12.	Cow in Calf, of any age, or Heifer in Calf, calved before 1st Jan. 1879, .	15	8	4
13.	Heifer calved on or after 1st Jan. 1879, .	10	5	3
14.	Heifer calved on or after 1st Jan. 1880, .	8	4	2
15.	Cow of any age and three or more of her descendants, male or female, .	15	8	4
		<hr/>		
				228
	Carry forward, . . .			£409

\* The Tweeddale Gold Medal, value £20, will be given for the best Shorthorn Bull in the Yard. All former Prize Animals are eligible to compete.

Brought forward, . . . £409

Section	POLLED ANGUS OR ABERDEEN.	Premiums.		
		1st.	2d.	3d.
		£	£	£
16.	Bull calved before 1st Dec. 1878, Breeder of best Bull, The Silver Medal.	20	10	5
17.	Bull calved on or after 1st Dec. 1878,	20	10	5
18.	Bull calved on or after 1st Dec. 1879,	10	5	3
19.	Cow of any age,	15	8	4
20.	Heifer calved on or after 1st Dec. 1878,	10	5	3
21.	Heifer calved on or after 1st Dec. 1879,	8	4	2
		<hr/>		
				147

## GALLOWAY.

22.	Bull calved before 1st Jan. 1879, Breeder of best Bull,—The Silver Medal.	20	10	5
23.	Bull calved on or after 1st Jan. 1879,	20	10	5
24.	Bull calved on or after 1st Jan. 1880,	10	5	3
25.	Cow of any age,	15	8	4
26.	Heifer calved on or after 1st Jan. 1879,	10	5	3
27.	Heifer calved on or after 1st Jan. 1880,	8	4	2
		<hr/>		
				147

## HIGHLAND.

28.	Bull calved before 1st Jan. 1878, Breeder of best Bull,—The Silver Medal.	20	10	5
29.	Bull calved on or after 1st Jan. 1878,	20	10	5
30.	Bull calved on or after 1st Jan. 1879,	10	5	3
31.	Cow of any age,	15	8	4
32.	Heifer calved on or after 1st Jan. 1878,	10	5	3
33.	Heifer calved on or after 1st Jan. 1879,	8	4	2
		<hr/>		
				147

Carry forward, . . . £850



Brought forward, . . . £850

Section	FAT STOCK.	Premiums.		
		1st.	2d.	
		£	£	
34.	Highland Ox calved before 1st Jan. 1878,	5	3	
35.	Highland Ox calved on or after 1st Jan. 1878,	4	2	
36.	Polled Ox calved before 1st Jan. 1879,	5	3	
37.	Polled Ox calved on or after 1st Jan. 1879,	4	2	
38.	Ox, of any other Pure or Cross Breed, calved before 1st Jan. 1879,	5	3	
39.	Ditto, calved on or after 1st Jan. 1879,	4	2	
40.	Cross-bred Heifer calved before 1st Jan. 1879,	5	3	
41.	Cross-bred Heifer calved on or after 1st Jan. 1879,	4	2	
				56
				<u>£906</u>

## CLASS II.—HORSES.

FOR AGRICULTURAL PURPOSES.	Premiums.			
	1st.	2d.	3d.	4th.
	£	£	£	£
1. Stallion foaled before 1st Jan. 1878, Breeder of best Stallion,—The Silver Medal.	35	25	15	5
2. Entire Colt foaled on or after 1st Jan. 1878,	25	15	8	4
3. Entire Colt foaled on or after 1st Jan. 1879,	15	10	5	3
4. Entire Colt foaled on or after 1st Jan. 1880,	12	8	4	2
5. Mare (with Foal at foot) foaled before 1st Jan. 1878,	25	15	8	4
6. Mare (in Foal) foaled before 1st Jan. 1878,	20	10	5	3
7. Filly foaled on or after 1st Jan. 1878,	15	8	4	2
8. Filly foaled on or after 1st Jan. 1879,	10	5	3	2
9. Filly foaled on or after 1st Jan. 1880,	8	4	2	1
10. Draught Gelding foaled before 1st Jan. 1878,	8	4	2	—
11. Draught Gelding foaled on or after 1st Jan. 1878,	6	3	1	—

Carry forward, . . . £369

	Brought forward, . . .	£369
	Premiums.	
	1st. 2d. 3d.	
• HUNTERS AND ROADSTERS.		
Section	£ £ £	
12. Brood Mare, with Foal at foot, suitable for Field, . . .	20 10 —	
13. Mare or Gelding, suitable for Field, foaled before 1st Jan. 1877, . . .	20 10 —	
14. Mare or Gelding, suitable for Field, foaled on or after 1st Jan. 1877, . . .	20 10 —	
15. Mare or Gelding, suitable as Hackney or Roadster, between 14 and 15 hands, . . .	10 5 —	
16. Stallion, Mare, or Gelding, for leaping, . . .	15 10 5	
	<hr/>	135
PONIES.		
17. Highland Stallion, 14½ hands and under, . . .	5 3	
18. Highland Mare or Gelding, between 13 and 14½ hands, . . .	5 3	
19. Mare or Gelding, between 12½ and 14 hands, . . .	4 2	
20. Mare or Gelding, under 12½ hands, . . .	4 2	
	<hr/>	28
STALLIONS FOR AGRICULTURAL PURPOSES.		
Stallion for Agricultural Purposes to serve in the District of the Show in season 1881; Competition to take place in spring, . . .	100	
	<hr/>	100
		£632

## CLASS III.—SHEEP.

		Premiums.			
		1st. 2d. 3d.			
		£	£	£	
BLACKFACED.					
Section					
1.	Tup above one shear, . . .	12	8	4	
2.	Shearling Tup, . . .	12	8	4	
3.	Three Ewes above one shear, . . .	10	5	2	
	Lambs shown with Ewes, . . .	2	1	—	
4.	Three Shearling Ewes or Gimmers, . . .	10	5	2	
5.	Aged Tup, 2 Ewes, 2 Shearlings, and 2 Lambs. The Ewes to have Lambs in Season 1881, and all bred by Exhibitor except aged Tup, . . .	8	4	2	
					99
Carry forward, . . .					£99

		Brought forward, . . . . .			£99		
		Premiums.					
		1st.	2d.	3d.			
Section	CHEVIOT.	£	£	£			
6.	Tup above one shear, . . . . .	12	8	4			
7.	Shearling Tup, . . . . .	12	8	4			
8.	Three Ewes above one shear, . . . . .	10	5	2			
	Lambs shown with Ewes, . . . . .	2	1	—			
9.	Three Shearling Ewes or Gimmers, . . . . .	10	5	2			
					85		
		BORDER LEICESTER.					
10.	Tup above one shear, . . . . .	12	8	4			
11.	Shearling Tup, . . . . .	12	8	4			
12.	Three Ewes above one shear, . . . . .	10	5	2			
13.	Three Shearling Ewes or Gimmers, . . . . .	10	5	2			
					82		
		LEICESTER.					
14.	Tup above one shear, . . . . .	3	2	—			
15.	Shearling Tup, . . . . .	3	2	—			
16.	Three Ewes above one shear, . . . . .	3	2	—			
17.	Three Shearling Ewes or Gimmers, . . . . .	3	2	—			
					20		
		COTSWOLD AND LINCOLN.					
18.	Tup above one shear, . . . . .	3	2	1			
19.	Shearling Tup, . . . . .	3	2	1			
20.	Three Ewes above one shear, . . . . .	3	2	1			
21.	Three Shearling Ewes or Gimmers, . . . . .	3	2	1			
					24		
		SHORT WOOLLED.					
22.	Tup above one shear, . . . . .	3	2	1			
23.	Shearling Tup, . . . . .	3	2	1			
24.	Three Ewes above one shear, . . . . .	3	2	1			
25.	Three Shearling Ewes or Gimmers, . . . . .	3	2	1			
					24		
		EXTRA SECTIONS.			1st.	2d.	
					£	£	
26.	Five Blackfaced Wethers, not above 4 shear,				4	2	
27.	Five Cheviot Wethers, not above 3 shear,				4	2	
28.	Five Half-bred* Wethers, not above 1 shear,				4	2	
29.	Five Cross-bred† Wethers, not above 1 shear,				4	2	
					24		
					£358		

\* Half-breds must be the progeny of any kind of Long-Woolled or Short-Woolled Tup (except Blackfaced) with Cheviot Ewes.

† Cross-breds must be the offspring of any Whitefaced or Short-Woolled Tup with Blackfaced Ewes, or the progeny of Blackfaced Tups with Whitefaced or Short-Woolled Ewes.

## CLASS IV.—WOOL.

		Premiums.	
		1st	2d.
		£	£
1. Woolled Tup, Blackfaced Breed,	.	3	2
2. Woolled Tup, Cheviot Breed,	.	3	2
3. Woolled Tup, Leicester Breed,	.	3	2
		<hr/>	
		£15	

*Note.*—Exhibitors do not require to make separate Entries for Wool, as all the Tups entered in the Breeds where Wool Prizes are offered are judged, and Tups exhibited for Wool only must be entered in the sections applicable to their breed and age in the class for Sheep.

## CLASS V.—SWINE.

		Premiums.		
		1st.	2d.	3d.
		£	£	£
LARGE BREED.				
1. Boar,	.	.	.	.
2. Sow,	.	.	.	.
3. Three Pigs, not above 8 months old,	.	.	.	.
		3	1	
		5	3	1
		4	2	1
		<hr/>		
		25		
BLACK OR BERKSHIRE.				
4. Boar,	.	.	.	.
5. Sow,	.	.	.	.
6. Three Pigs, not above 8 months old,	.	.	.	.
		5	3	1
		5	3	1
		4	2	1
		<hr/>		
		25		
SMALL BREED.				
7. Boar,	.	.	.	.
8. Sow,	.	.	.	.
9. Three Pigs, not above 8 months old,	.	.	.	.
		5	3	1
		5	3	1
		4	2	1
		<hr/>		
		25		
		<hr/>		
		£75		

## EXTRA STOCK.

Animals not included in the Sections for Competition may be exhibited as Extra Stock, and will receive Honorary Premiums when specially commended, as follows :—

## CATTLE AND HORSES.

Very highly commended,	.	Medium Gold Medal.
Highly commended,	.	Minor Gold Medal.
Commended,	.	The Silver Medal.

## SHEEP AND SWINE.

Very highly commended,	.	Minor Gold Medal.
Highly commended,	.	The Silver Medal.
Commended,	.	Medium Silver Medal.

## CLASS VI.—COLLIE DOGS.

	Premiums.		
	1st.	2d.	3d.
	£	£	£
1. Long haired Dog, not above 6 years old, .	3	2	1
2. Long haired Bitch, not above 6 years old, .	3	2	1
3. Short haired Dog, not above 6 years old, .	3	2	1
4. Short haired Bitch, not above 6 years old, .	3	2	1
	<hr/>		
	£24		

## CLASS VII.—POULTRY.

FIRST PREMIUM—ONE SOVEREIGN; SECOND PREMIUM—TEN SHILLINGS  
—in all the Sections of Poultry.

Aged Birds must have been hatched previous to, and Cockerels and Pullets in, 1881.

	Section	Section
DORKING— <i>Silver Grey</i> , .	1. Cock.	2. 2 Hens.
	3. Cockerel.	4. 2 Pullets.
DORKING— <i>Coloured</i> , .	5. Cock.	6. 2 Hens.
	7. Cockerel.	8. 2 Pullets.
COCHIN-CHINA, .	9. Cock.	10. 2 Hens.
	11. Cockerel.	12. 2 Pullets.
BRAHMAPOOTRA, .	13. Cock.	14. 2 Hens.
	15. Cockerel.	16. 2 Pullets.
SPANISH, . . .	17. Cock.	18. 2 Hens.
	19. Cockerel.	20. 2 Pullets.
SCOTCH GREY, . .	21. Cock.	22. 2 Hens.
	23. Cockerel.	24. 2 Pullets.
HAMBURG— <i>Pencilled</i> .	25. Cock.	26. 2 Hens.
	27. Cockerel.	28. 2 Pullets.

POULTRY—*continued.*

	Section	Section
HAMBURG— <i>Spangled</i> , . . .	29. Cock.	30. 2 Hens.
• •	31. Cockerel.	32. 2 Pullets.
ANY OTHER PURE BREED, {	33. Cock.	34. 2 Hens.
	35. Cockerel.	36. 2 Pullets.
GAME— <i>Black or Brown</i> {	37. Cock.	38. 1 Hen.
<i>Reds</i> , . . . {	39. Cockerel.	40. 1 Pullet.
GAME— <i>Any other</i> {	41. Cock.	42. 1 Hen.
<i>Pure Breed</i> , . . . {	43. Cockerel.	44. 1 Pullet.
BANTAMS— <i>Game</i> , . . .	45. Cock.	46. 1 Hen.
•	47. Cockerel.	48. 1 Pullet.
BANTAMS— <i>Sebright</i> , . . .	49. Cock.	50. 2 Hens.
	51. Cockerel.	52. 2 Pullets.
BANTAMS— <i>Any other</i> {	53. Cock.	54. 2 Hens.
<i>Pure Breed</i> , . . . {	55. Cockerel.	56. 2 Pullets.
DUCKS— <i>White Aylesbury</i> , . . .	57. Drake.	58. 1 Duck.
	59. Drake (Young).	60. 1 Duckling.
DUCKS— <i>Rouen</i> , . . .	61. Drake.	62. 1 Duck.
	63. Drake (Young).	64. 1 Duckling.
DUCKS— <i>Any other Pure</i> {	65. Drake.	66. 1 Duck.
<i>Breed</i> , . . . {	67. Drake (Young).	68. 1 Duckling.
TURKEYS— <i>Any Pure Breed</i> , . . .	69. Cock.	70. 1 Hen.
	71. Cock (Poult).	72. 1 Hen (Poult).
GEESE— <i>Any Pure Breed</i> , . . .	73. Gander.	74. 1 Goose.
	75. Gander (Young).	76. 1 Gosling.

Amount of Poultry Premiums, £114.

## CLASS VIII.—IMPLEMENTS.

The following Implements, being yet in a comparatively undeveloped state, will be dealt with as new inventions, and Premiums will be offered, as follows:—

Section	Premiums.		
	1st.	2d.	3d.
	£	£	£
1. Potato Lifter, . . . . .	15	10	5
2. Turnip Lifter, . . . . .	15	10	5
3. Artificial Manure Distributor, . . . . .	15	10	5
			£90

### REGULATIONS FOR COMPETITIVE TRIALS.

1. Implements to be entered with the Secretary on or before 3d June. Received in the Yard on Tuesday, 19th July, and till ten o'clock on the morning of Tuesday, 26th July. Exhibited Tuesday, Wednesday, Thursday, and Friday, 26th, 27th, 28th, and 29th July.

2. The Society will provide ground near Stirling at a suitable season (probably in October), and make arrangements for the proper trial of the Implements.

3. The Premiums will not be awarded without thorough and exhaustive open and competitive trials.

4. The Committee shall have power to withhold the Prizes where there is not sufficient merit, or to apportion them as they think best.

#### REGULATIONS FOR EXHIBITION OF IMPLEMENTS AT WORK.

5. At the time of the competitive trials the Society will provide ground suitable for the exhibition at work of

- |              |                 |
|--------------|-----------------|
| 1. Ploughs.  | 3. Diggers, and |
| 2. Grubbers. | 4. Cultivators. |

6. The Implements must be entered and exhibited as specified in Rule 1.

7. Exhibitors must, when making their entries, specify on the Entry Schedule the quantity of ground required at the time of the trials, which will probably be in October.

8. Exhibitors must bind themselves at the time of entry to pay their proportion of the land required at such rate as the Committee may determine, whether they bring their Implements forward or not.

Reference is made to the General Regulations for the terms on which other Implements and Machines may be exhibited at the Show.

#### CLASS IX.—BEE HUSBANDRY.

£20 and 2 Silver Medals have been granted to the Caledonian Apiarian and Entomological Society. Information to be obtained from, and Entries made with, Mr R. J. Bennett, 50 Gordon Street, Glasgow.

#### ABSTRACT OF PREMIUMS.

1. Cattle,	.	.	.	.	£906	0	0
2. Horses,	.	.	.	.	632	0	0
3. Sheep,	.	.	.	.	358	0	0
4. Wool,	.	.	.	.	15	0	0
5. Swine,	.	.	.	.	75	0	0
6. Collie Dogs,	.	.	.	.	24	0	0
7. Poultry,	.	.	.	.	114	0	0
8. Implements,	.	.	.	.	90	0	0
9. Bee Husbandry,	.	.	.	.	21	12	0
10. Tweeddale Gold Medal,	.	.	.	.	20	0	0
11. Six Silver Medals to Breeders of best Aged Bulls and best Stallion,	.	.	.	.	4	16	0
12. Extra Stock, say	.	.	.	.	80	0	0
					<u>£2340</u>	<u>8</u>	<u>0</u>

# GENERAL SHOW OF STOCK AND IMPLEMENTS

**At GLASGOW, 1882.**

The District connected with the Show comprises the Counties of Lanark, Ayr, Argyll, Renfrew and Bute.

*Premiums will be offered for the following Classes :—*

## CATTLE.

### SHORTHORN.

Bull calved before 1st January .....	1880
Bull calved on or after 1st January .....	1880
Bull calved on or after 1st January... ..	1881
Cow of any age.	
Heifer calved on or after 1st January .....	1880
Heifer calved on or after 1st January .....	1881

NOTE.—The question as to calculating the ages of Shorthorn Cattle from 1st December in place of 1st January is under the consideration of the Directors.

### AYRSHIRE.

Bull calved before 1st January .....	1880
Bull calved on or after 1st January .....	1880
Bull calved on or after 1st January .....	1881
Cow in milk calved before 1st January .....	1879
Cow in milk calved on or after 1st January .....	1879
Cow in milk or in calf of any age, bred by Exhibitor.	
Cow in calf calved before 1st January .....	1879
Heifer in calf calved on or after 1st January .....	1879
Heifer calved on or after 1st January .....	1880
Heifer calved on or after 1st January .....	1881

### POLLED ANGUS OR ABERDEEN.

Bull calved before 1st December .....	1879
Bull calved on or after 1st December .....	1879
Bull calved on or after 1st December .....	1880
Cow of any age.	
Heifer calved on or after 1st December .....	1879
Heifer calved on or after 1st December .....	1880

### GALLOWAY.

Bull calved before 1st January .....	1880
Bull calved on or after 1st January .....	1880
Bull calved on or after 1st January .....	1881
Cow of any age.	
Heifer calved on or after 1st January .....	1880
Heifer calved on or after 1st January .....	1881

### HIGHLAND.

Bull calved before 1st January .....	1879
Bull calved on or after 1st January .....	1879



Bull calved on or after 1st January .....	1880
Cow of any age.	
Heifer calved on or after 1st January .....	1879
Heifer calved on or after 1st January .....	1880

## FAT STOCK.

Highland Ox calved before 1st January .....	1879
Highland Ox calved on or after 1st January .....	1879
Polled Ox calved before 1st January .....	1880
Polled Ox calved on or after 1st January .....	1880
Ox of any other pure or cross breed calved before 1st January ...	1880
Ox of any other pure or cross breed calved on or after 1st Jan....	1880
Cross-bred Heifer calved before 1st January .....	1880
Cross-bred Heifer calved on or after 1st January .....	1880

## HORSES

*For Agricultural Purposes.*

Stallion foaled before 1st January .....	1879
Entire Colt foaled on or after 1st January .....	1879
Entire Colt foaled on or after 1st January .....	1880
Entire Colt foaled on or after 1st January .....	1881
Mare with foal at foot, foaled before 1st January .....	1879
Mare in foal, foaled before 1st January .....	1879
Filly foaled on or after 1st January .....	1879
Filly foaled on or after 1st January .....	1880
Filly foaled on or after 1st January .....	1881
Family Prize.—The family to consist of 5 animals, foaled before 1st January 1880 (male or female, the offspring of one sire), not necessarily the property of one person.	
Do. Do. foaled on or after 1st January 1880, do. do.	
Draught Gelding foaled before 1st January .....	1879
Draught Gelding foaled on or after 1st January .....	1879
Stallion to serve in the District of the Show in season 1882	

## HUNTERS AND ROADSTERS.

Brood Mare, with foal at foot, suitable for field, foaled before 1st January .....	1878
Yeld Mare or Gelding, suitable for field, foaled before 1st January .....	1878
Filly or Gelding, suitable for field, foaled on or after 1st January	1878
Filly or Gelding, suitable for field, foaled on or after 1st January	1879
Mare or Gelding, suitable for carriage, foaled before 1st January	1879
Mare or Gelding, suitable as Hackney or Roadster, between 14 and 15 hands.	
Mare or Gelding, not exceeding 15 hands, for milk cart of heavy draught.	
Mare or Gelding, not exceeding 14½ hands, for milk cart of light draught.	

## PONIES.

Highland Stallion, 14½ hands and under.	
Highland Mare or Gelding, between 13 and 14½ hands.	
Mare or Gelding, between 12½ and 14 hands.	
Mare or Gelding, under 12½ hands.	

## SHEEP.

*Ewes and Gimmers to be exhibited in pens of three; Wethers and Hogs in pens of five.*

## BLACKFACED.

Tup above one shear.  
 Shearling Tup.  
 Ewes above one shear.  
 Shearling Ewes or Gimmers.

*Family Prize.—The Family to consist of one Tup, two Ewes, two Shearlings, and two Lambs. The Ewes to have Lambs in Season 1882, and all bred by Exhibitor except Tup.*

## CHEVIOT.

Tup above one shear.  
 Shearling Tup.  
 Ewes above one shear.  
 Shearling Ewes or Gimmers.

## BORDER LEICESTER.

Tup above one shear.  
 Shearling Tup.  
 Ewes above one shear.  
 Shearling Ewes or Gimmers.

## LONG-WOOLLED OTHER THAN BORDER LEICESTER.

Tup above one shear.  
 Shearling Tup.  
 Ewes above one shear.  
 Shearling Ewes or Gimmers.

## SHROPSHIRE.

Tup above one shear.  
 Shearling Tup.  
 Ewes above one shear.  
 Shearling Ewes or Gimmers.

## SHORT-WOOLLED OTHER THAN SHROPSHIRE.

Tup above one shear.  
 Shearling Tup.  
 Ewes above one shear,  
 Shearling Ewes or Gimmers.

## EXTRA SECTIONS.

- Blackfaced Wethers not above four shear.
- Cheviot Wethers not above three shear.
- \* Half-bred Wethers not above two shear.
- † Cross-bred Wethers not above two shear.
- Half-bred Wether Hogs.
- Cross-bred Wether Hogs.

*Sheep not included in the above Classes must be entered as Extra Stock.*

\* Half-breds must be the progeny of any kind of Long-woolled or Short-woolled Tup (except Blackfaced) with Cheviot Ewes.

† Cross-breds must be the offspring of any Whitefaced or Short-woolled Tup with Blackfaced Ewes, or the progeny of Blackfaced Tups with Whitefaced or Short-woolled Ewes.

**WOOL.**

Woolled Tups of the Blackfaced, Cheviot, and Leicester Breeds.

**SWINE.**

*Pigs to be exhibited in pens of three.*

**LARGE BREED.**

Boar.  
Sow.  
Pigs not above 8 months old.

**BLACK OR BERKSHIRE.**

Boar.  
Sow.  
Pigs not above 8 months old.

**SMALL BREED.**

Boar.  
Sow.  
Pigs not above 8 months old.

**POULTRY.**

To be shown in Pens of One Cock or Cockerel and Two Hens or Pullets of each of the following breeds, except in the sections for Ducks, Turkeys, Geese, and Hens and Pullets of the Game and Malay Breeds, where only one bird is required:—

Dorking—Silver-Grey.  
Dorking—coloured.  
Cochin-China.  
Bramahpootra.  
Spanish  
Scotch Grey.  
Hamburg  
Any other pure Breed.

Game Black or Brown Reds.  
Game—Any other pure Breed.  
Bantams—Any pure Breed.  
Ducks—White Aylesbury.  
Ducks—Rouen.  
Ducks—Any other pure Breed.  
Turkeys—Any pure Breed.  
Geese—Any pure Breed.

**DAIRY PRODUCE.**

Cured Butter, not less than 7 lbs.	Dunlop Cheese, 30 lbs. and upwards.
Powdered Butter, do.	Cheese of any other variety, 30 lbs. and upwards.
Fresh Butter, three ½-lb. rolls.	Cheese, any variety, 15 lbs. and under.
Cheddar Cheese, 56 lbs. and upwards.	
Cheddar Cheese, 14 lbs. and under.	

**IMPLEMENTS.**

The following special Premiums will be offered for competition:—

Combined Reapers and Binders, or Lifting and Binding Machines  
—Three Premiums of £100, £50, and £25.  
Seed Cleaners—Three Premiums of £15, £10, and £5.

At the time of the trials the Society will provide ground suitable for the exhibition at work of Mowers, Horse-rakes, and Hay Collectors.

## GENERAL SHOW OF STOCK & IMPLEMENTS

AT

INVERNESS IN 1883.

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THE GENERAL SHOW of STOCK and IMPLEMENTS will, in 1883, take place at INVERNESS, when Premiums will be awarded by the Society.

The Classes of Stock will be fixed after communication with the members of the Society in the district, which comprises the Counties of Inverness, Elgin, Nairn, Ross and Cromarty, Caithness, Sutherland, and Orkney and Shetland.

The following special Premiums for Implements will be offered for competition :—

TURNIP THINNERS.—Three Premiums of £15, £10, and £5.

POTATO PLANTERS.—Three Premiums of £15, £10, and £5.

WEED ERADICATORS.—Three Premiums of £15, £10, and £5.

At the time of the trials the Society will provide ground suitable for the exhibition at work of Ploughs, Grubbers, Diggers, and Cultivators.

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## GENERAL SHOW OF STOCK & IMPLEMENTS

AT

EDINBURGH IN 1884.

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THE CENTENARY of the SOCIETY being in 1884, it has been resolved to hold the GENERAL SHOW of STOCK and IMPLEMENTS at EDINBURGH that year.

The district in connection with the Show will, as on former occasions, embrace the Counties of Edinburgh, Haddington, Linlithgow, and Peebles.

The Classes of Stock will be afterwards notified.



APPENDIX (C).

LIST OF MEMBERS

OF

THE HIGHLAND AND AGRICULTURAL  
SOCIETY OF SCOTLAND,

1881,

ALPHABETICALLY ARRANGED, AND DISTINGUISHING  
THE YEAR OF ADMISSION.

By the Charter of 1834 the Society consists of two classes, Ordinary and Honorary or Corresponding Members. The number of Honorary or Corresponding Members resident in the United Kingdom must not exceed twenty, but with power to the Society to elect as Honorary Associates persons resident abroad, not subjects of Her Majesty, who may have been benefactors to the Society, or who are distinguished for their skill in Art or Science, provided that the number of such Foreign Associates shall not exceed twenty.

By a Bye-Law passed in 1873, with reference to the Supplementary Charter of 1856, successful Candidates for the Society's Agricultural Diploma are thereby eligible to be elected free Life Members of the Society.

Candidates for Ordinary Membership must be proposed by a Member, and are elected at the half-yearly General Meetings in January and June. It is not necessary that the Member who proposes the Candidate should attend the meeting.

The ordinary subscription is £1, 3s. 6d. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from £12, 12s. to £7, 1s. Proprietors farming the whole of their own lands, whose Assessment on the Valuation Roll does not exceed £500 per annum, and all Tenant-Farmers, Office-Bearers of Local Agricultural Associations, Resident Agricultural Factors, Land Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding £500 per annum, are admitted on a subscription of 10s. annually, which may be redeemed by one payment, varying according to the number of previous annual payments, from £5, 5s. to £3.

According to the Charter, a Member who homologates his Election by paying his first subscription cannot retire until he has paid, in annual subscriptions, or otherwise, an amount equivalent to a life composition.

Members of the Society receive the Transactions on application, and are entitled to apply for District Premiums—to report Ploughing Matches for the Medal—to free admission to the Show-Yard, and to exhibit Stock and Implements at reduced rates. Firms are not admitted as Members, but if one partner of a firm becomes a Member, the firm is allowed to exhibit at Members' rates.

Members having Candidates to propose are requested to send their names to FLETCHER NORTON MENZIES, Esq., No. 3 George IV. Bridge, Edinburgh.

The Members marked \* have been Presidents; and † Vice-Presidents.

# LIST OF MEMBERS.

Her Most Gracious Majesty THE QUEEN.

\*His Royal Highness The PRINCE OF WALES.

Admitted

1872

1873

Admitted

1880 Aalvik, E. A. Ostenso, Hardanger, Norway  
1883 ABERCORN, His Grace the Duke of, K.G., London  
1862 ABERCROMBY, Right Hon. Lord, Airthrey Castle, Stirling  
1873 ABERCROMBY, Sir Robert John, of Birkenbog, Bart., Forglan, Turriff  
1868+ ABERDEEN, Right Hon. the Earl of, Hadulo House, Methlick  
1872 Abernethy, Peter, Halls, Penicuik  
1877 Abernethy, Thomas, Halls, Penicuik  
1865 ABINGER, Right Hon. Lord, Inverlochy Castle, Kingussie  
1878 Ackers, Benjamin St John, Prinkash Park, Painswick  
1859 Adam, Alex. F., W.S., 19 Claremont Crescent, Edinburgh  
1855 Adam, Aeneas, Humbertson, Dingwall  
1860 Adam, John, Closeburn Castle, Thornhill  
1878 Adam, Robert, City Chamberlain, Edinburgh  
1856 Adam, Stephen, Wool-Merchant, 11 Hillside Crescent, Edinburgh  
1876 Adam, Thomas, National Bank, Aberdeen  
1874 Adam, Thomas, of Lynegar, Bank Agent, Wick  
1876 Adam, William, Bush, Banchory-Ternan  
1880 Adam, William, Advocate, Aberdeen  
1853 ADAM, Right Hon. W. Patrick, of Blair-Adam  
1881 Adams, James, M.D., Oathlaw, Forfar  
1872 Adamson, Henry D., Balquharn, Alford  
1874 Addie, Gavin, Western Club, Glasgow  
1875 Addie, John, Viewpark, Uddingston  
1859 Adie, Alexander James, Linlithgow  
1850 AGNEW, Sir Andrew, of Lochnew, Bart., Stranraer  
1873 Agnew, James, High Portencallie, Stranraer  
1843 Agnew, R. Vans, of Sheuchan and Barnbarroch, Wigtown  
1875 Agnew, William, Balwherrie, Stranraer  
1857 Aikman, Thomson, Glasgow  
1876 Ainslie, Ainslie Douglas, of Delgaty Castle, Turriff

Admitted

1864 Ainslie, Daniel (of the Gart, Callander), 48 Moray Place, Edinburgh  
1859 Ainslie, David, of Costerton, Blackshields  
1848 Ainslie, John, Hillend, Pentland, Loan-head  
1853 Ainslie, R., of Elvingston, Gladsmuir  
1875 Ainslie, William, Stobo Mill, Stobo  
1852+ AIRLIE, Right Hon. the Earl of, K.T., Cortachy Castle, Kirriemuir  
1874 Aitchison, James, 80 Princes Street, Edinburgh  
1851 Aitchison James (late Proncey Mains, Dornoch), Australia  
1865 Aitchison, Lieut.-Col., of Drummorie, Musselburgh  
1878 Aitchison, John H., Lawhouse, Coldingham  
1870 Aitchison, Peter, West Garleton, Haddington  
1863 Aitchison, William, Linhope, Hawick  
1877 Aitken, Dr A. P., St Anns, Morningside Drive, Edinburgh—*Chemist to the Society*  
1861 Aitken, George, Tyrie, Kirkcaldy  
1854 Aitken, James, Markie, Prestonkirk  
1877 Aitken, John, sen., V.S., Causewayside, Edinburgh  
1864 Aitken, John Gillespie, Southfield, Stirling  
1879 Aitken, John M., Crieft, *Free Life Member*  
1878 Aitken, Mark, Traprain, Prestonkirk  
1857 Aitken, Robert, Drumore, Campbeltown  
1869 Aitken, Robert, Kilmany, Cupar Fife  
1860 Aitken, Thomas, 5 Grosvenor Crescent, Edinburgh  
1854 Aitken, Thomas, Listonshields, Balerno  
1875 Aitkenhead, Alex., Shawmoss, Pollokshaws  
1878 Aitkenhead, William, Roughlands, Larchbert  
1870 Alexander, Arch., Merchant, West Linton  
1872 Alexander, George, Easter Lilliesleaf, St Boswells  
1876 Alexander, George, South Balnook, Huntly  
1831 ALEXANDER, General, Sir J. Edward, C.B., of Westerton, Bridge of Allan



## *List of Members of the*

Admitted	Admitted
1870 Alexander, James, of Balmule, Dunfermline	1862 Anderson, George, of Woodhouse, Ecclefechan
1875 Alexander, James, 60 North Street, Glasgow	1863 Anderson, George, of Hawthorn Bank, Selkirk
1855 Alexander, John, Broughty Ferry	1859 Anderson, George B., Maikie Pinkerton, Dunbar
1876 Alexander, John, 184 Buchanan Street, Glasgow	1861 Anderson, Henry, Burnside, Stanley
1881 Alexander, John, Ballindarg, Kirriemuir	1873 Anderson, James, Bradbury, Enville, Stourbridge
1861 Alexander, Thomas, Corn Factor, Perth	1863 Anderson, James, Newbigging, Dundee
1858 Alexander, William, Bent of Haulkerton, Laurencekirk	1865 Anderson, James, Solicitor, Inverness
1865 Alison, James M., General Merchant, Beauly	1879 Anderson, James, Ben Lawers, Kilmartin
1833 Allan, Alexander, Advocate, 5 Hillside Crescent, Edinburgh	1871 Anderson, John, Airies, Kirriemuir
1861 Allan, Alexander, Kinnon Park, Methven, Perth	1873 Anderson, John, Chapel, Moffat
1864 Allan, Alexander, Carbars, Wishaw	1857 Anderson, John, Craigton, Banchory
1867 Allan, Andrew, Munnoch, Dalry, Ayr	1863 Anderson, John, Mill of Wester Coull, Tarland
1874 Allan, James, Corn Merchant, Borrowstounness	1857 Anderson, John, 14 Dean Terrace, Edinburgh
1875 Allan, James, jun., Borrowstounness	1859 Anderson, John, Smithstown, Croy, Kilsyth
1851 Allan, James, Clifton, Mid Calder	1873 Anderson, John, Strachurmore, Inveraray
1855 Allan, James, Clachlands, Lamlash	1879 Anderson, John, Royal Hotel, Blairgowrie
1870 Allan, James, jun., Balmacool, Brodick	1871 Anderson, John A., St Albans, Perth
1877 Allan, James, Kirklands, Dolphinton	1876 Anderson, John M., Burngrains, Ellon
1854 Allan, John, Billie Mains, Ayrton	1870 Anderson, John S. (of Whiteside, Dumfries), Dalhousie Mains, Dalkeith
1861 Allan, John, Crieffvechter, Crieff	1864 Anderson, Peter, Blackfay, Sorbie
1873 Allan, John, Redhugh, Cockburnspath	1878 Anderson, Peter, Duneaves, Fortingal
1878 Allan, John, Culthill, Dunkeld	1870 Anderson, Robert, Alleyford, Kirkgunzeon, Dumfries
1863 Allan, Richard, Howden, Jedburgh	1856 Anderson, Robert, of Lochdhu, Nairn
1875 Allan, Robert, Glenmore, Kilmelford, Lochgilphead	1871 Anderson, Robert, Middlebank, Errol
1863 Allan, Robert A., Eyemouth	1878 Anderson, Robert, Drumnakyle, Foss, Pitlochry
1852 Allan, T. W. Murray, of Glenfeochan, Oban	1881 Anderson, Robert, Provost of Stirling
1874 Allan, William, Clury, Grantown	1881 Anderson, Robert, Daugh, Tarland
1870 Allan, William, Drummondreoch, Ferintosh	1861 Anderson, Robert H., Lynne Regis
1871 Allan, William, Park, Clackmannan	1850 Anderson, Robert Hood, Devonshire Club, London
1873 Alston, David, Hyndford Wells, West Linton	1876 Anderson, R. Lang, Milliken Park, Renfrewshire— <i>Free Life Member</i>
1864 Alston, George, of Craighead, Hamilton	1858 Anderson, Robt. Wm., Clerk of Supply, Forfar
1850 Alston, John P., of Muirburn, Strathaven	1832 Anderson, Thomas, of Glandrisnaig, Lainslaw, House, Stewarton
1881 Amour, John, Farmer and Dairyman, Cramond Bridge	1878 Anderson, Thomas B., Solicitor, Dumfries
1877 Anderson, Colonel, of Bourhouse, Dunbar	1854 Anderson, T. Scott, W.S., 10 Norfolk Crescent, Hyde Park, London, W.
1833 ANDERSON, Sir Alexander, Aberdeen	1865 Anderson, W., Ballimore, Tigh-na-bruiach
1874 Anderson, Alexander, Berryhill, Dundee	1877 Anderson, William, Barnell, Kirkmichael, Maybole
1877 Anderson, Alexander Dunlop, of Ardshiel, Appin	1857 Anderson, Wm., Hattonburn, Banchory
1879 Anderson, Archibald Turnbull (Dickson & Turnbull), Perth	1867 Anderson, W. H., Clifton Villa, Anstruther
1873 Anderson, Arthur, M.D., C.B., Sunnybrae, Pitlochry	1870 Anderson, William, Café Royal Hotel, Edinburgh
1866 Anderson, B. T. G., of Tushielaw, Selkirk	1876 Anderson, William, Wardes, Kintore
1877 Anderson, Charles, jun., <i>North British Agriculturist</i> , 377 High Street, Edinburgh	1876 Anderson, Wm., Wellhouse, Alford
1878 Anderson, Charles, Balsalloch, Port William	1873 Anderson, William W., Norton Mains, Ratho
1875 Anderson, Charles, Fettykil, Leslie	1857 Andrew, Hugh, Keprigan, Campbeltown
1825 Anderson, D., of Moredun, 24 Moray Place, Edinburgh	1881 Andrew, Hugh, Acredales, Haddington
1877 Anderson David, Cassindilly, Cupar Fife	1873 Andrew, Robert, Allans, Inchinnan, Paisley
1872 Anderson, Findlay, of Inchyra, Grange, Polmont	1870 Andrew, Wm. J., Banker, Conlbridge
	1875 Andrews, John, Land Steward, Melville, Ladybank

# *Highland and Agricultural Society, 1881.*

## Admitted

- 1878 Andrews, John, junr., Pathcondie, Ladybank  
 1863 Angus, John, Whitefield, Morpeth  
 1871 Annan, David, The Torr, Moonzie, Cupar  
 1872 ANSTRUTHER, Sir W. C. J. C., of Anstruther, Bart., Carmichael House, Thankerton  
 1862 ANSTRUTHER, Sir Robert, of Balcaskie, Bart., Pittenweem  
 1858 Anton, James, Seafield, Forres  
 1833 ARBUTHNOTT, Right Hon. Viscount, Arbuthnott House, Fordoun  
 1864 ARBUTHNOTT, Hon. Mrs. Inchmartine  
 1873 ARBUTHNOTT, Hon. The Master of, Arbuthnott House, Fordoun  
 1855 Archibald, Thomas, of Viewbank, Lasswade  
 1864 Archer, Thomas, late Ramly Lodge, Lymington, Hants  
 1876 Archibald, T. B., Nisbetfield, Ladybank  
 1869 Archibald, James, Duddingston, South Queensferry  
 1861 Archibald James, Jamestown House, Monasterewan, Co. Kildare, Ireland  
 1869 Archibald, John, Duddingston, South Queensferry  
 1844\* ARGYLL, His Grace the Duke of, K.T., Inveraray Castle, Inveraray  
 1853 Arklay, John, late Gorthlick, Inverness  
 1861 Arklay, Robert, of Ethiebeaton, Dundee  
 1850 Arkley, R. H., Dun House, Montrose  
 1879 Armour, John, Niddry Mains, Winchburgh  
 1862 Arnot, David, Friarton, Newport, Fife  
 1871 Arnot, Wm., Glamis Mains, Glamis  
 1862 Arras, Walter, Fodderty, Dingwall  
 1865 Arras, William, Nairn  
 1853 Arundell, W. F. H., of Barjarg, Auldgrith, Dumfries  
 1873 Ashdown, A. H., Uppington, Salop—  
*Free Life Member*  
 1874 Asher, William G. C., Fettes House, Inverness  
 1845 Askew, Henry, William, late Conishead Priory, Ulverston  
 1863 Askew, W., of Pallinsburn, Coldstream  
 1860\* ATHOLE, His Grace the Duke of, K.T., Blair Castle, Blair Athole  
 1841 ATHOLE, Her Grace the Duchess Dowager of, Dunkeld  
 1877 Auld Peter, Buteland, Balerno  
 1878 Austin James C., The Gill, Cummertrees, Annan  
 1851 Austin, R. S., late Middleton, Muthill  
 1880 Austin, Wm., Bank Agent, Thornhill  
 1873 AVELAND, Right Hon. Lord, Normanton Park, Oakham, Rutlandshire  
 1875 Aveling, Thomas, Rochester, Kent  
 1849 Aytoun, James, Advocate, London  
 1844 Aytoun, Roger, S. of Inchdairnie, Kirkcaldy  
 1824 Baillie, Evan, of Dochfour, Inverness  
 1839 BAILLIE, Right Hon. Henry James, of Redcastle, Killearnan, Inverness  
 1865 Baillie, John Menzies, of Culter Allers, 15 Northumberland Street, Edinburgh

## Admitted

- 1869 Baillie, John, Fullarton, Penicuik  
 1865 Baillie, John B., of Leys, Inverness  
 1847 BAILLIE, Sir William, of Polkemmet, Bart., Whitburn  
 1877 Bain, Alex., Factor, Coltness, Wishaw  
 1875 BAIN, Sir James, 3 Park Terrace, Glasgow  
 1864 Bain, James, Bank of Scotland, Glasgow  
 1875 Bain, Sam. F., Inch of Leckie, Gargunnoch  
 1877 Bain, W. P. C., Lochrin Iron Works, Edinburgh  
 1878 Baird, Archibald, 67 Robertson Street, Glasgow  
 1868 Baird, Arthur E., Cadogan Mansions, Sloane Square, London  
 1876 Baird, Colin C., V.S., Veterinary College, Clyde Street, Edinburgh  
 1860 BAIRD, Sir David, of Newbyth, Bart., Prestonkirk  
 1877 Baird, Henry, Abbot's Grange, Falkirk  
 1875 Baird, Hugh, jun., 17 Westbourne Gardens, Glasgow  
 1843 BAIRD, Sir James Gardiner, of Saughton Hall, Bart., Inch House, Liberton  
 1870 Baird, John, Hall, Kirkconnell, Sanquhar  
 1870 Baird, John, Solicitor, Lockerbie  
 1871 Baird, John, jun., Solicitor, Lockerbie  
 1880 Baird, John, of Knoydart, Inverie House, Isle Ornsay, Skye  
 1877 Baird, John W., 26 South Back of Canon-gate, Edinburgh  
 1873 Baird, Thomas, Huddleshope, Peebles  
 1873 Baird, William, of Elie, Fife  
 1873 BALFOUR of Burleigh, Right Hon. Lord, Kennet House, Clackmannan  
 1863 Balfour, Arthur J., of Whittinghame, M.P., Prestonkirk  
 1843 Balfour, Colonel David, of Balfour and Trenabie, Kirkwall  
 1857 Balfour, Major Francis W., of Fernie Castle, Cupar-Fife  
 1879 Balfour, Professor Isaac Bayley, The University, Glasgow  
 1839 Balfour, John, of Balbirnie, Markinch  
 1839 Balfour, Prof. John Hutton, M.D., Inverleith House, Edinburgh  
 1880 Balfour, J. H., 7 Glencairn Crescent, Edinburgh  
 1869 Balfour, John M., of Pilrig W.S., Edinburgh  
 1873 Balfour, Lieut.-Col. Robt. Fred., younger of Balbirnie, Markinch  
 1860 Ballantyne, John, Salisbury View, Windermere  
 1869 Ballantyne, T., Netherton, East Kilbride  
 1870 Ballingal, And. H., W.S., Perth  
 1871 Ballingal, Neil, Sweetbank, Markinch  
 1859 Ballingal, Wm., Sweetbank, Markinch  
 1857 Ballingal, D., Factor, Blairdrummond  
 1860 Ballingal, George, Clarlaw, St Boswells  
 1861 Ballingal, John, Dunbog, Newburgh  
 1863 Balmer, Thomas, Fochabers  
 1862 Banks, Meyrick, of Letterewe, Dingwall  
 1859 Barbour, G. F. (of Bonskeid, Pitlochry), 11 George Square, Edinburgh  
 1873 Barbour, Robt., Gillfoot, Kirkbean, Dumfries

# *List of Members of the*

Admitted	Admitted
1858 Barclay, Charles A., Aberdour House, Fraserburgh	1868 Bell, Alexander, Stobhill, Lockergie
1855 Barclay, George, Davochbeg, Golspie	1879 Bell, Alexander, Kirkton of Tealing, Dundee
1858 Barclay, George, Strocherie, Banff	1872 Bell, And., late Fans, Earlston
1834 Barclay, George Robertson, late of Keavil, Dunfermline	1856 Bell, David, Todhall, Cupar Fife
1862 Barday, J. W., M.P., 60 Dee Street, Aberdeen	1871 Bell, George, Barns of Claverhouse, Dundee
1859 Barclay, Robert, Drums, Falkland	1863 Bell, Jas., Quarry Brook, Maghill, Liverpool
1865 Barclay, Thomas, Skelbo, Dornoch	1879 Bell, Dr James M., Kingskettle, Fifeshire
1839 Barker, Thomas, Sydney, Australia	1881 Bell, James, Gilchorn, Arbroath
1862 Barr, James, jun., Whiteshaw, Carlisle	1871 Bell, John (of Castlecreavie), 66 Frederick Street, Edinburgh
1875 Barr, William, Kerryemont, Rothsay	1876 Bell, John, Merryhilllock, Fraserburgh
1880 Barrett, Robert Bell, Camserney Cottage, Aberfeldy	1880 Bell, John, Stenton, St Monance
1863 Barrie, James, Harden Mains, Jedburgh	1871 Bell, M. Montgomery, W.S., 22 Contes Crescent, Edinburgh
1846 Barstow, Chas. M., C.A., 32 India Street, Edinburgh	1846 Bell, R., of Lunna, Belmont, Falkirk
1867 Bartholomew, Hugh, of Glenorchard, Torrance of Campsie	1869 Bell, Robert, Phospho Guano Co., Seacombe, Cheshire
1855 Bartholomew, James, Duntarvie, Winchburgh	1856 Bell, Thomas, Ballinshoe, Kirriemuir
1875 Bartlemore, Robert, Netherhouses, Lochwinnoch	1865 Bell, Thomas, Craigkennoch Terrace, Burntisland
1880 Bartlemore, William, Solicitor, Paisley— <i>Secretary of the Renfrewshire Agricultural Society</i>	1877 Bell, Thomas, (Messrs Robey & Co.), Lincoln
1873 Barty, James, Procurator-Fiscal, Dunblane	1871 Bell, William, of Gribda, Kirkcudbright
1871 Bate, John, of Broadchapel, Lochmaben	1869 Bell, William, Keanacoil, Dunkeld
1861 Bathgate, James, Ormiston, Tranent	1876 Bell, William, Sheriffhills, Thankerton
1877 Bathie, Wm., Auctioneer, Arbroath	1878 Bell, William, Todholes, Annan
1873 Bauchope, Thomas, Land Surveyor, East Brucefield, West Calder	1879 Bell, William, Balmuth, Tealing, Dundee
1877 Baxter, David, Ladyburn, Maybole	1877 Bennet, Arthur, Bogside, Cardenden, Fife
1854 Baxter, Edmund, W.S., 9 Rutland Square, Edinburgh	1858 Benton, Joseph, Harthill, Whitehouse
1875 Bayley, George, of Manuel, 13 Regent Terrace, Edinburgh	1858 Benton, William, Cattle, Whitehouse
1864 Bayne, John, Builder, Bridge of Allan	1869 Berry, George, Longleat, Horningsham Warminster, Wilts
1869 Bayne, Lewis, Kinnel Park, Abergyle	1863 Berry, Walter, 11 Athole Crescent, Edinburgh
1876 Bean, Alex., Netherthirld, Rothie Norman	1877 Bertram, David N., St Katherine's Works, Sciennes Street, Edinburgh
1876 Bean, George, Balquhain, Inverurie	1864 Bertram, James, Addinston, Lauder
1876 Bean, Wm., Newton, Cairnie, Huntly	1874 Bertram, John, Hartside, Lauder
1863 Beath, David, Auchmuir, Leslie	1854 Bertram, John S., Cranshawes, Dunse
1854 Beattie, James, Newbie House, Annan	1854 Bertram, T. Hardy, C.E., 1 Foxgrave Road, Beckenham, Kent
1879 Beattie, James, Rookdale Cottage, Perth	1852 Bertram, William, of Nisbet, Biggar
1870 Beattie, Jn., Bulmansknowe, Canonbie	1877 Bertram, William, St Katherine's Works, Sciennes Street, Edinburgh
1877 Beattie, Simon, Preston Hall, Annan	1861 Berwick, David, Collairnie, Newburgh, Fife
1878 Beattie, William J. P., Newbie, Annan	1878 Berwick, John, Allanbank, Dumfries
1875 Beck, Thomas Coker, Crowell Rectory, Tetsworth, Oxen— <i>Free Life Member.</i>	1876 Best, John, Inveravon, Polmont
1876 Beedie, James, The Mains, Ardlaw, Fraserburgh	1857 Bethune, Admiral, of Balfour, C.B., Markinch
1876 Beedie, William, Pitgair, Fisherie, Turriff	1848 Bethune, Alex., of Blebo, Cupar Fife
1858 Begg, John, Distiller, Lochnagar, Aberdeen	1863 Bethune, Colonel R., of Nydie, St Andrews
1873 Begg, Robert, Blarnie, Luss	1864 Bethune, Murdo, Brae, Dingwall
1873 Begg, Robert Burns, Sheriff-Clerk, Kinross	1861 Bett, David Inches, Newhall, Coupar-Angus
1871 Beith, Donald, W.S., 15 Grosvenor Crescent, Edinburgh	1857 Bett, James, Bolfracks, Aberfeldy
1877 Beith, Gilbert, Ballochneck, Buchlyvie	1859 Beveridge, David, Buckthorns, Largo
1871 Belfrage, A. W., C.E., 31 Ann Street, Edinburgh	1862 Beveridge, George, 243 High Street, Kirkcaldy
1849 Belfrage, James, Samuelston East Mains, Haddington	1869 Beveridge, Jas., Crombie, Dunfermline
1867 Bell, Alexander, Linton, Kelso	1872 Beveridge, William, of Bonnyton, Dunfermline
	1862 Beveridge, William, 243 High Street, Kirkcaldy
	1878 Biggar, James, Grange Farm, Dalbeattie

Admitted

- 1853 Biggar, T., of Chapelton, Dalbeattie  
 1859 Binnie, John, Birnieknows, Cockburnspath  
 1877 Binnie, Thomas, Auction Mart, Falkirk  
 1875 Binny, Andrew, 9 Hart Street, Edinburgh  
 1865 Binny, Graham, W.S., 9 Hart Street, Edinburgh  
 1874 Bird, Ebenezer, Glenduckie, Newburgh, Fifa  
 1858 Bird, James B., Fishwick, Paxton  
 1875 Birse, John, Summerfield, St Ola, Orkney  
 1874 Biscoe, T. Ramsay, of Newton, Inverness  
 1879 Bisset, Alexander, Farm Manager, Balfarg, Markinch  
 1873 Bisset, Hugh, Pitarrow, Laurencekirk  
 1873 Bisset, Thomas S., Agricultural Engineer, Blairgowrie  
 1865 Black, Alex., Shotover Estate Office, Wheatley, Oxon  
 1875 Black, Gavin, Coalmaster, Easter Moffat, Airdrie  
 1877 Black, George, Sea-View Works, Berwick-on-Tweed  
 1879 Black, George, Victoria Street, Perth  
 1880 Black, George, Mill of Craibston, Newhills, Aberdeen  
 1879 Black, Baillie George, Banker, Inverness  
 1877 Black, James, of Auchentoshan, Duntocher  
 1871 Black, James, *Elgin Courier and Courier*, Elgin  
 1851 Black, James, London  
 1875 Black, John, Coalmaster, Airdrie  
 1859 Black, John, Setonhill, Longniddry  
 1859 Black, John, Ford, Westfield, Cornhill, Northumberland  
 1876 Black, John, Cortachy, Kirriemuir  
 1844 Black, Robert, Glasgow  
 1867 Black, Robert, Liberton Mains, Liberton  
 1878 Black, Thomas, Craigenrosh, Stranraer  
 1877 Black, William Connel, of Kailzie, Peebles  
 1876 Blackburn, James, Killearn House, Glasgow  
 1870 Blacklaw, Alex. Scott (late Milton of Arbuthnot, Fordoun), Brazil  
 1855 Blackley, John, 107 Bath Street, Glasgow  
 1857 Blacklock, Adam, late Minnygap, Moffat  
 1875 Blackwood, Alex., Stobo Mill, Stobo  
 1862 Blackwood, William, Publisher, 45 George Street, Edinburgh  
 1881 Blaikie, Wm. L., Holydean, St Boswell's  
 1850 Blair, Sir Edward Hunter, of Blairquhan, Bart, Maybole  
 1869 Blair, E. J. Stopford, of Penninghame, Newton Stewart  
 1860 Blair, James, of Glenfoot, Tillicoultry  
 1864 Blair, James, Aberfoyle  
 1874 Blair, Jn., W.S., 9 Ettrick Road, Edinburgh  
 1874 Blair, Patrick, Advocate, Sheriff-Substitute, Inverness  
 1879 Blair, Patrick, W.S., 7 York Place, Edinburgh  
 1844 Blair, Captain William Fordyce, of Blair, R.N., Dalry  
 1876 Blake, John, Dunrobin Mains, Golspie  
 1873 Bland, Thomas, Golden Dog Lane, Norwich, Norfolk  
 1836 Blane, Colonel Robert, C.B.

Admitted

- 1847 Blanshard, George, Smith's Place, Edinburgh  
 1843+ BLANTYRE, Right Hon. Lord, Erskine House, Glasgow  
 1877 BLANTYRE, The Hon. the Master of, Seiberscross, Rogart  
 1861 Blues, Andrew A., 58 George Square, Edinburgh  
 1879 Blyth, James, Leckiebank, Auchtermuchty  
 1851 Bogle, J., Balcargh, Auchtermuchty  
 1863 Bolam, John, Chathill, Northumberland  
 1866 Bolam, Robert George, Berwick-on-Tweed  
 1858 Bolton, Joseph C., of Carbrook, M.P., Lamberth  
 1867 Bone, Quintin, Greenan, Ayr  
 1879 Bonnor, G. H., Edinburgh  
 1853 Bontine, Wm. Cuninghame Graham, of Gartmore, Stirling  
 1879 Bonthron, Alexander, Newton of Falkland, Falkland  
 1870 Boog, Thomas Elliot, Timpendean, Jedburgh  
 1842 Booth, Jas. Godfrey, Seed Merchant, Hamburg  
 1878 Boothby, Robert Cunningham, Hyndhope, Selkirk  
 1878 Borland, John, Auchencairn, Closeburn, Thornhill  
 1873 Borthwick, Alex. Hay, Hopsrig, Langhohn  
 1854 Borthwick, Gilbert, Barelaes, Coldstream  
 1858 Borthwick, John, V.S., Kirkliston  
 1846 Borthwick, John, of Crookston, Heriot  
 1859 Borthwick, John James M., Lyneholm, Langholm  
 1838 Borthwick, Thomas Chalmers, Hopsrig, Langholm  
 1853 Borthwick, Wm. Henry, late Crookston, Gorebridge  
 1865 Borthwick, Wm., Whitehaven Castle, Whitehaven  
 1864 Borton, John, Barton House, Malton  
 1858 Boswall, Sir Geo. Houstoun, of Blackadder, Bart., Chirnside  
 1876 Bower, Alfred Lance, Strathaird House, Broadford  
 1863 Bowhill, James, Banker, Ayrton  
 1854 Bowie, Alexander, Mains of Kelly, Arbroath  
 1875 Bowie, Robert, Parkhead, Linlithgow  
 1859 Bowman, James, Newark, St Monance  
 1879 Bowman, James, Square, Huntly  
 1865 Boyd, Colonel James Hay, of Townend, Symington, Kilmarnock  
 1872 Boyd, John, Simprin Mains, Coldstream  
 1861 Boyd, John B., of Cherrytrees, Kelso  
 1863 Boyd, William B., Ormiston, Kirkbank, Kelso  
 1875 Brackenridge, Alexander, V.S., Stevenston Mains, Holytown  
 1869 Brakenridge, William, Rogerthorpe Hall, Pontefract  
 1865 Braid, Andrew, Humble, Kirknewton  
 1873 Bramwell, John, Marionburgh, Ballindalloch—*Free Life Member*  
 1858 Brand, Charles, Mains of Fordoun, Fordoun

## *List of Members of the*

### Admitted

- 1872 Brand, James, Dunbar  
 1855 Brash, James, Hallyards, Kirkliston  
 1876 Brebner, Alexander, Balquindochy, Methlick  
 1876 Brebner, Robert, Lumbs, Lonmay, Aberdeen  
 1878 Brechin, James, 1 West Newington Terrace, Edinburgh  
 1872 Breingan, Alexander, Merchant, Helensburgh  
 1880 Bridges, Andrew, Engineer, North Berwick  
 1872 Brigham, John, Castle Gate Implement Works, Berwick-on-Tweed  
 1865 Brims, James, Thurso  
 1880 Broad, Anthony, Edenside Road, Kelso  
 1878 Broadfoot, Peter, West Mains, Kirkcinner  
 1868 Broadwood, Thomas, of Fulfordless, Crowhill, Dunbar  
 1878 Broatch, George, Thwait, Annan  
 1881 Brock, Hugh, V.S., 112 North Street, Glasgow  
 1876 Brock, J. E., East Overton, Kirkliston  
 1874 Brock, John, Ankhorne, Wick  
 1873 Brock, William, Barns of Clyde, Yoker  
 1857 Brockley, Robert M., Gourlaw, Rosewell  
 1875 Brodie of Brodie, Brodie Castle, Forres  
 1859 Brodie, James, 9 Nelson Street, Edinburgh  
 1848 Brodie, James C., Thorntonloch, Dunbar  
 1869 Brodie, James W., Cloheen, Buttevant, Co. Cork  
 1872 Brodie, John, Palacehill, Ancrum, Jedburgh  
 1840 Brodie, J. Clerk, of Idvies, W.S., 26 Moray Place, Edinburgh  
 1877 Brodie, Thomas Dawson, of Gairdoch, W.S., 9 Ainslie Place, Edinburgh  
 1878 Brodie, William, of Bush, Barkerland, Dumfries  
 1879 Brook, Edward, Hoddam Castle, Ecclefechan; Meltham Hall, Huddersfield  
 1874 Brooke, A. B., Cardney, Dunkeld  
 1855 Broomfield, Thomas, Lauder  
 1867 Bromfield, W. J., Old Greenlaw, Greenlaw, Dunse  
 1875 Brothie, George, Easington Estate Offices, Loftus, Saltburn by the Sea  
 1854 Broughton, Robert Henry, of Rowchester, Greenlaw, Berwickshire  
 1863 Brown, Adam (late Helmburn, Selkirk), Devonshire  
 1844 Brown, Alexander J. Dennistoun, of Balloch, Balloch Castle, Dumbarton  
 1873 Brown, Alexander, Banker, Oban  
 1862 Brown, Andrew, M.D., late Edinburgh  
 1879 Brown, Andrew, Factor for the Earl of Zetland, Kerse, Falkirk  
 1858 Brown, Archibald, Craig, Udny  
 1874 Brown, Archibald C., Gladstone Park, Bishopston  
 1866 Brown, David, Banker, Maybole  
 1878 Brown, David, Ellerslie, Kirkmahoe  
 1871 Brown, George, Grassmistoun, Craill  
 1839 Brown, George, Watten Mains, Watten  
 1861 Brown, George, of Westfield, Cupar Fife  
 1860 Brown, James, Hardgrave, Lockerbie  
 1865 Brown, James, Whinpark, Kilmarnock

### Admitted

- 861 Brown, James, St Andrews  
 879 Brown, James W., Letham, Inverkeithing  
 877 Brown, George, 57 Hanover Street, Edinburgh  
 855 Brown, James, 80 South Portland Street, Glasgow  
 873 Brown, James Geddes, Distiller, Keith  
 1877 Brown, James, Weston, Carnwath  
 1878 Brown, James, of Orchard, Carlisle  
 1878 Brown, James Greig, Mouswald, Dumfries  
 1872 Brown, John, Murrays, Ormiston, Tranent  
 1857 Brown, John, Boghall, Biggar  
 1876 Brown, John, of Colton, Dunfermline  
 1860 Brown, John, Ingliston, Dumfries  
 1877 Brown, John, Lissensmoss, Kilwinning  
 1878 Brown, John, Airds of Kirkconnell, New Abbey, Dumfries  
 1880 Brown, John, East Housebyres, Gala-shiels  
 1852 Brown, John George, Cluny Cottage, Pitlochry  
 1878 Brown, John Gordon, Lochanhead, Dumfries  
 1876 Brown, John H. (late Aberchalder, Fort Augustus), New Zealand  
 1860 Brown, John C., Between-the-Waters, Ecclefechan  
 1870 Brown, Jos., Hermitage, Dalbeattie  
 1876 Brown, Joseph, Sootywalls, Fordoun  
 1832 Brown, Matthew, Greenock  
 1861 Brown, Oliphant, Shiel, New Galloway  
 1856 Brown, Peter, Craigton, Bishopston  
 1871 Brown, Peter, Milton of Luncarty, Redgorton  
 1881 Brown, Richard, C.A., 29 St Andrew Square, Edinburgh  
 1866 Brown, Robert E., Bewley Street, York  
 1875 Brown, Thomas, Pentland Mains, Loanhead  
 1849 Brown, Thomas, Weston, Dunsyre, Dolphinton  
 1863 Brown, Thomas, late Locherlour, Crieff  
 1863 Brown, Thomas, 6 Argyle Crescent, Joppa  
 1877 Brown, Thomas Morris, Achnacarry, Fort-William  
 1871 Brown, William, Factor, Earlsmill, Forres—*Free Life Member*, 1873  
 1872 Brown, William, Parkgatestone, Biggar  
 1854 Brown, William, of Dunkinty, Elgin  
 1873 Brown, William, Pitnamoon, Laurence-kirk  
 1874 Browne, A. H., Dxford Hall, Chathill, Northumberland  
 1873 Browne, Colville, Park House, Long Melford, Suffolk—*Free Life Member*  
 1875 Brownlee, James, East Whitburn Farm, Whitburn  
 1872 Brownlie, Alex., Haughhead, Earlston  
 1877 Brownlie, James, Nether Alderston, Mid-Calder  
 1877 Brownlie, Robert, Bogside, Newmains, Carlisle  
 1875 Brownlie, Thomas, 182 Hope Street, Glasgow  
 1868 Bruce, Alexander, Millhill, Mintlaw

Admitted

- 1879 Bruce, Andrew, Jordanston, Meigle  
 1874 Bruce, Andrew Hamilton Tyndall, of Falkland, Ladybank  
 1878 Bruce, David C., Broadlands, Huntly  
 1877 Bruce, Edward, 26 Greenside Place, Edinburgh  
 1864 Bruce, George, Pennan Farm, Fraserburgh  
 1868 Bruce, George, Heatherwick, Keith Hall  
 1874 Bruce, George, Seedsman, 35 Market Street, Aberdeen  
 1871 Bruce, George C., C.E., 21 Castle Street, Edinburgh  
 1875 Bruce, Henry, of Ederline, Lochgilphead  
 1865 Bruce, James, Burnside, Fochabers  
 1876 Bruce, James, Collithie, Gartly  
 1869 Bruce, James, Marchbank Terrace, Dumfries  
 1868 Bruce, J., Inverquhomery, Mintlaw  
 1829 Bruce, John, of Sumburgh, Lerwick  
 1863 Bruce, J., jun., Sumburgh, Lerwick  
 1842 Bruce, John, W.S., 7 Melville Crescent, Edinburgh  
 1876 Bruce, Peter, Myreton, Insh, Aberdeen  
 1863 Bruce, Robert, Manor House Farm, Great Smeaton, Northallerton  
 1871 Bruce, Robert, Uddingston  
 1880 Bruce, Lieut.-Gen. Robert, of Glenduglie, Milnathort  
 1875 Bruce, Hon. Robert Preston, M.P., Broomhall, Dunfermline  
 1852 Bruce, Hon. Thomas Charles, M.P., 42 Hill Street, Berkeley Square, London, W.  
 1855 Bruce, Thomas, of Arnot, Kingsdale, Kennoway  
 1864 Bruce, Sir William C., of Stenhouse, Bart., Falkirk  
 1875 Bruce, William L., Glenkill, Lamlash  
 1870 Bruges, Edward C., Dalgie, New Cumnock  
 1866 Brunt, James, Broomlands, Kelso  
 1867 Brunt, J. S., Ladhope House, Galashiels  
 1870 Bryan, F. G. D., Drumpellier, Coatbridge  
 1878 Bryce, Andrew, Craigentinny, Jock's Lodge, Edinburgh  
 1865 Bryce, James, East Whitburn, Whitburn  
 1881 Bryce, John, Architect, 131 George Street, Edinburgh  
 1877 Bryce, William C., 26 South Back of Canongate, Edinburgh  
 1880 Bryden, John, New Mains, Scone, Perth  
 1878 Bryden, William, Ironmonger, Lockerbie  
 1862 Brydon, Adam, Netherbarns, Galashiels  
 1864 Brydon, H., Thirlestane Hope, Selkirk  
 1850 Brydon, James, Kinnelhead, Moffat  
 1864 Brydon, James, jun., Holm of Dalquhairn, Dalry, New Galloway  
 1873 Brydon, Robert, The Dene, Seaham Harbour—*Free Life Member*  
 1879 Brydson, Walter S., Land Steward, Portmore, Eddleston  
 1850 Bryson, Robert, Merchant, Glasgow  
 1852 Bryson, W. G., Cullen House, Cullen  
 1828\*† BUCCLEUCH and QUEENSBERRY, His Grace the Duke of, K.G., Dalkeith  
 1835 BUCCLEUCH and QUEENSBERRY, Her Grace the Duchess of

Admitted

- 1880 Buchan, Alexander, 72 Northumberland Street, Edinburgh  
 1854 Buchanan, A., Whitehouse, Stirling  
 1857 Buchanan, Alexander, Norwood, Milngavie  
 1881 Buchanan, Dr Alexander, Tires, Tobermory  
 1838 Buchanan, Andrew, of Auchintorlie, Bowling  
 1870 Buchanan, Archibald, Barskimming, Mauchline  
 1849 Buchanan, Lieut.-Col. David C. R. Carrick, of Drumpellier, Coatbridge  
 1873 Buchanan, David, Carscadden Mains, New Kilpatrick  
 1853 Buchanan, Dun, Auchinbreck, Colintraive, Greenock  
 1877 Buchanan, D. M'L. B., of Boquhan, Killearn  
 1878 Buchanan, Francis • Wellesly, Leny, Callander  
 1873 BUCHANAN, Sir George H. Leith, of Ross, Bart., Ross Priory, Alexandria  
 1851 Buchanan, Isaac, Hamilton, Canada  
 1876 Buchanan, Captain J. R. Gray, of Scotstone, Eastfield House, Cambuslang  
 1838 Buchanan, John, London  
 1872 Buchanan, John, C.E., 24 George Street, Edinburgh  
 1877 Buchanan, John, Gartness, Killearn  
 1876 Buchanan, Robt., Blairquhosh, Strathblane  
 1876 Buchanan, Robert, Letter Farm, Killearn  
 1842 Buchanan, Walter, Glasgow  
 1828 Buchanan, Wm., Merchant, Glasgow  
 1875 Buchanan, William, 391 Parliamentary Road, Glasgow  
 1863 Buist, Robert, Cattle Salesman, 11 West Lauriston Place, Edinburgh  
 1865 Bulloch, Ar., Milliken, East Kilpatrick  
 1879 Bulloch, George, of Kinloch, Dunkeld  
 1875 Bulloch, Matthew, 11 Park Circus, Glasgow  
 1870 BURDETT-COURTIS, Right Hon. Baroness, Ehrenberg Hall, Torquay  
 1874 Burn, Forbes, Hardacres, Coldstream—*Free Life Member*  
 1863 Burn, John, Edman, Kelso  
 1873 Burness, Wm., Redford, Laurencekirk  
 1877 Burnet, James, Dolphington, Cramond Bridge  
 1877 Burnett, Alex. E., W.S., 47 Heriot Row, Edinburgh  
 1867 Burnett, Major-General Francis Claude, of Gadgirth, Tarbolton  
 1848 Burnett, George, Advocate, 21 Walker Street, Edinburgh  
 1858 BURNETT, Sir Robert, of Leys, Bart., Crathes Castle, Banchory  
 1838 Burnley, W. F., 24 Ainslie Place, Edinburgh  
 1872 Burns, And., Harelaw, Longniddry  
 1866 Burns, Jas. C., of Glenlee, Hamilton  
 1865 Burns, J., of Castle Wemyss, Greenock  
 1861 Burns, John William, of Kilmahew, Cardross  
 1875 Burr, Alexander, Tulloford, Old Meldrum

## Admitted

- 1877 Burr, John M., Netherton, Fyvie, Aberdeen  
 1867 Burr, Rev. P. Lorimer, Jundie Manse, Dundee  
 1873 Burrell, James, Denovan Mains, Denny  
 1854 Burroughs, Major-General F. W. Traill, C.B., of Rousay, Orkney  
 1867 Burton, J. Tait, of Toxside, Gorebridge  
 1857 Burton, J., Rosewell Mains, Rosewell  
 1869+ Butte, Most Noble the Marquis of, K.T., Mount Stuart, Rothesay  
 1861 Buttar, David, Corston, Coupar-Angus  
 1877 Butter, Albert, Union Bank, Edinburgh  
 1825 Butter, Arch., of Faskally, Pitlochry  
 1877 Butters, Archd., Van Mildert House, Lenzie  
 1876 Buyers, James, junior, Easter Brakie, Frickham  
 1878 Byres, James Edward, Greenrae, Canonbie  
 1844 Cadell, Alex. Todd, R.A., V.C., Madras  
 1856 Cadell, Henry, of Grange, Bonness  
 1869 Cadzow, James, Clarendon, Linlithgow  
 1872 Cadzow, Robt., Thornyhill, Carmichael, Lanark  
 1878 Caird, Alex. McNeel, Kilmun  
 1853 Caird, James, of Cassenearrie, C.B., 8 Queensgate Gardens, London  
 1864 Cairns, James, Balquharn, Menstrie  
 1870 Cairns, John, Parkhill House, Newburgh, Fife  
 1861 Cairns, William, Belhie, Auchterarder  
 1871 Cairns, Robert, Bertha Park, Perth  
 1845+ CAITHNESS, Right Hon. The Earl of, Barrogill Castle, Wick  
 1872 Calder, Adam, Halterburn, Kelso  
 1853 Calder, Francis, Yetholm Mains, Kelso  
 1857 Calder, James, Colgrain, Cardross  
 1870 Calder, John, Muirton, Elgin  
 1846 Calder, Marcus, Elwickbank, Kirkwall  
 1857 Calder, Robert, Little Swinton, Coldstream  
 1858 Calder, R., Whitehouse, Lumphanan  
 1851 Calder, W., Cattle Salesman, 19 Archibald Place, Edinburgh  
 1872 Calder, W. A., Oxenrig, Coldstream  
 1841 Caldwell, Fred., of Missinish, 4 Hanover Terrace, Regent's Park, London  
 1878 Caldwell, Hugh, of Braes, Kilbarchan  
 1862 Caldwell, Wm., Boydstone, Ardrossan  
 1857 Cameron, Alexr., Coat Hill Farm, Airdrie  
 1865 Cameron, Alex. (of Mainhouse), Highfield, Elgin  
 1859 Cameron, Donald, of Lochiel, M.P., Achnacarry, Fort-William  
 1861 Cameron, D. Colin, Tallisker, Broadford, Skye  
 1869 Cameron, Duncan, Banker, Thurso  
 1877 Cameron, Duncan, Kinloch Rannoch  
 1881 Cameron, Duncan, Fettes, Redcastle  
 1878 Cameron, Hugh Ewen, Clunes, Fort-William  
 1881 Cameron, James, Murthill Farina Works, Forfar  
 1878 Cameron, Dr James Angus, of Firhall, Nairn

## Admitted

- 1850 Cameron, J. M., 52 Line Street, London  
 1871 Cameron, John, Glackieriska, Appin  
 1881 Cameron, John, Keil, Fort William  
 1876 Cameron, J. G., of Garrows, Anulree, Dunkeld  
 1862 Cameron, William, Edinburgh  
 1837 Campbell, Alex., of Auchindarroch, Lochgilphead  
 1835 Campbell, Alexander, of Cammo, 6 Charlotte Square, Edinburgh  
 1863 Campbell, Alex. (late Blairton), Aberdeen  
 1863 Campbell, A. H., of Little Grove, Herts  
 1857 CAMPBELL, Lt.-Col. Sir Archd. C., of Blythswood, Bart., Renfrew  
 1880 Campbell, Rev. Arch., Assapool, Bunesan, Mull  
 1868 Campbell, A., Dunmore Park, Stirling  
 1865 Campbell, Lt.-Col. A. H., Ochertyre, Stirling  
 1865 Campbell, Lt.-Col., of South Hall, Greenock  
 1878 Campbell, Angus, Soroba, Oban  
 1854 Campbell, Arthur, of Catrine, W.S., 4 Randolph Crescent, Edinburgh  
 1876 CAMPBELL, Sir Archibald S. L., of Succoth, Bart., 23 Moray Place, Edinburgh  
 1864 Campbell, C. Macpherson, of Ballimore, Dalvey, Forres  
 1853 Campbell, Chas. V. H., of Nether Place, Manchine  
 1847 Campbell, C., of Colgrain, Camis Easkan House, Helensburgh  
 1838 Campbell, C. G., of Stonefield, Tarbert  
 1858 Campbell, Rear-Admiral Colin Yorke, Barbreck, Lochgilphead  
 1875 Campbell, Captain Duncan, of Inverneil and Ross, Ardrishaig  
 1879 Campbell, Duncan, Stronach, Glenulyon, Aberfeldy  
 1868 Campbell, Major D. P. (of Balliveolan, Bonaw), New Club, Edinburgh  
 1858 Campbell, D. T., Duiletter, Dalmally  
 1839 Campbell, Farquhar (of Rum), New Club, Edinburgh  
 1871 Campbell, George, Rhodes, North Berwick  
 1873 Campbell, George, Kilkea, Maguney, Co Kildare—*Free Life Member*  
 1863 Campbell, George William, late Mayfair, London  
 1867 Campbell, Hector A. (of Auchnacloch, Oban), Ardfeanish, Bunesan, Mull  
 1834 CAMPBELL, Sir Hugh Hume, of Marchmont, Bart., Dunse  
 1838 CAMPBELL, Sir James, of Aberuchil, Bart., Wheatmead Park, Lydney  
 1875 Campbell, James, Rosebank, Gatehouse  
 1838 Campbell, James, London  
 1847 Campbell, J., of Tillichowan, Alexandria  
 1877 Campbell, Jas., Ormaig, Lochgilphead  
 1849 Campbell, James A., of Stracathro, M.P., Brechin  
 1860 Campbell, James G., of Killyleoch, 23 Windsor Street, Edinburgh  
 1874 Campbell, John, of Kilberry, Tarbert  
 1848 Campbell, John, of Possil, Torquay  
 1846 Campbell, J. L., of Achalader, Blairgowrie

Admitted

- 1874 Campbell, John 15 Exchange Square, Glasgow  
 1857 Campbell, Jn., Rhemeul, Campbelltown  
 1857  
 1877  
 1861  
 Roseneath, Helensburgh  
 1863 Campbell, John Graham, of Shirvan, Castleton, Lochgilphead  
 1875 Campbell, John R., Inveruglas, Arrochar  
 1877 Campbell, John Stephen Deans, of Corraith, Ayrshire  
 1863 Campbell, Neil Colquhoun, of Barnhill, Sheriff of Ayr, 81 Great King Street, Edinburgh  
 1838 Campbell, Ord Graham, 5 Oxford Terrace, Edinburgh  
 1861 Campbell, R. F. F., of Craigie, M.P., Ayr  
 1877 Campbell, Robert Hume, of Glendaruel, Argyllshire  
 1858 Campbell, Sylvester, Kinellar, Blackburn, Aberdeen  
 1876 Campbell, Silvester, jun., Toffhills, Aberdeen  
 1860 Campbell, Thos., Croftness, Aberfeldy  
 1863 Campbell, T. H., of Millfield, Polmont  
 1856 Campbell, T. W., of Walton Park, Dalbeattie  
 1858 Campbell, William, Solicitor, 14 Almada Street, Hamilton  
 1878 Campbell, William, Carterton, Lockerbie  
 1871 CAMPERDOWN, Right Hon. the Earl of, Camperdown, Dundee  
 1879 Cannan, James, Urioch, Castle Douglas—*Free Life Member*  
 1877 Cannon, John, Oongeth, Kirkgunzeon  
 1863 Cant, James, Orr Bridge, Kirkcaldy  
 1879 Cantlie, Charles A., Keithmore, Dufftown  
 1850 Carfrae, T., Land Surveyor, 9 Osborne Terrace, Edinburgh  
 1845 Carlyle, T. J., of Templehill, Waterbeck, Ecclefechan  
 1881 Carmichael, George Henry Gibson, Castle Craig, Dolphinton  
 1880 Carmichael, John, Coldstream  
 1880 Carmichael, M. W. A. Thomson, Carlowrie, Kirkliston  
 1880 Carmichael, Peter, Bowmore, Islay  
 1881 Carmichael, Thomas David Gibson, yr. of Skirling, Castle Craig, Dolphinton  
 1856 CARMICHAEL, Sir William H. Gibson, of Castle Craig and Skirling, Bart., Dolphinton  
 1856 CARMICHAEL, Hon. Charles, St Andrews  
 1847 Carnegie, D., of Stronvar, Lochearnhead  
 1881 Carnegie, F. P., Merchant, Perth  
 1869 Carnegie, Henry L., of Kinblethmont, Arbroath  
 1852 Carnegie, James, W.S., 16 Windsor Street, Edinburgh  
 1880 Carnegie, James, of Aytoun Hill, Newburgh, Fife  
 1858 Carnegie, William, of Eastertown, Dunlapple, Brechin  
 1858 Carnegie, W., junior, Coul, Forfar  
 1880 Carnegie, Wm. C., Floors Castle, Kelso  
 1850 Carnegie, John, Glasgow

Admitted

- 1869 Carphin, Jas. Rhind, C.A., 137 George Street, Edinburgh  
 1878 Carr, Robert, Felkington, Norham, Berwick-on-Tweed—*Free Life Member*  
 1876 Carre, Thomas A. Riddell, of Caverscarre, St Boswells  
 1871 Carrick, Charles, Baad, Stirling  
 1872 Carrick, Thos. A., Easter Cambusdrennie, Stirling  
 1854 Carruthers, John, of Miln, Kirkhill, Moffat  
 1870 Carruthers, John, Tundergarth, Lockerbie  
 1876 Carruthers, Joseph, Annan Bank, Lockerbie  
 1875 Carruthers, Robert, *Courier Office*, Inverness  
 1870 Carruthers, R. B., Huntingdon Lodge, Dumfries  
 1838 Carstairs, Drysdale, Hailes House, Fairfield, Liverpool  
 1869 Carswell, David, junior, Straiton, Leuchars  
 1880 Carter, James, Corn Exchange, Berwick  
 1868 Cartwright, T. R. B. Leslie Melville, Melville House, Ladybank  
 1861 Carver, John, Kinloch, Meikle  
 1871 CATCHAERT, Lieut.-Colonel the Hon. Adolphus F., Caldera, Dunse  
 1877 Cathcart, James F., 135 Buchanan Street, Glasgow  
 1857 Cathcart, R., of Pitcairrie, Auchtermuchty  
 1872 Catley, W. E., of Edderton, Tain  
 1865 Cattanaach, A., of Auchintorlie, Paisley  
 1876 Caven, Thomas, Birkshaw, Glencairn, Dunscore  
 1871 Caverhill, John, Greenburn, Aytoun  
 1839 CAWDOR, Right Hon. the Earl, Stackpole Court, Pembroke, South Wales  
 1877 Cecil, Right Hon. Lord Arthur, Orchard Mains, Innerleithen  
 1877 Cecil, Right Hon. Lord Lionel, Traquair, New Hall, Innerleithen  
 1874 Chalmers, Archibald, of Kipp, Dalbeattie  
 1871 Chalmers, James, Shielhill, Stanley, Perth  
 1879 Chalmers, John, Westwood, Stanley, Perth  
 1860 Chalmers, Thomas, of Longcroft House, Linlithgow  
 1864 Chambers, Robert, 10 Claremont Crescent, Edinburgh  
 1870 Chambers, Thomas, of Palnutho, Abbey Town, Cumberland  
 1864 Chambers, William, Soutarton, Forgue, Huntly  
 1849 Chancellor, J. G., of Shieldhill, Biggar  
 1857 Chandler, Henry, Salford  
 1859 Chaplin, Geo. C. Child, of Colliston, Arbroath  
 1880 Chaplin, George Robertson, of Murlingden, Brechin  
 1880 Chaplin, Capt. Thomas Robertson, Murlingden, Brechin  
 1873 Chapman, James, Ballencrieff Mill, Bathgate  
 1873 Chapman, Mungo, Auctioneer, Bathgate  
 1879 Charles, John, Town and County Bank, Inverurie  
 1878 Charlton, John, Corn Merchant, Dumfries  
 1867 Charlton, Matthew, jun., Browdeanlaws, Jedburgh



- Admitted  
 1860 Cheape, Lieut.-Col. Charles, of Kilundine, Lochaline, Morven, Argyllshire  
 1864 Cheape, G. C., of Strathtyrum, Wellfield, Strathmiglo  
 1881 Cheape, James, yr. of Lathockar, St Andrews  
 1888 Chiene, Geo. Tod, C.A., 27 Northumberland Street, Edinburgh  
 1860 Chirnside, G., Edrington House, Berwick  
 1865 Chisholm, The, Erchless Castle, Inverness  
 1865 Chisholm, Duncan, Craskie, Cannich, Beauly  
 1874 Chisholm, John, Chapel Rossan, Stranraer  
 1854 Chisholm, John, Charleston, Inverness  
 1874 Chisholm, John, Ironmonger, 8 Church Street, Inverness  
 1850 Christie, Andrew, Glencairn, Oreti, Southland, New Zealand  
 1850 Christie, Charles J., Westbank, Tranent  
 1862 Christie, C. J., Cherrybank, Newhaven Road, Edinburgh  
 1879 Christie, Francis Walter, Dairsie Mains, Cupar Fife  
 1873 Christie, James, Bandeath, Stirling  
 1865 Christie, James, Blandfield, Edinburgh  
 1873 Christie, James, Culthenhove Mains, St Ninians  
 1835 Christie, Captain James, 1 Torphichen Street, Edinburgh  
 1876 Christie, James M., Sunnyside, Prestonkirk  
 1846 Christie, John, 10 Pitville Parade, Cheltenham  
 1872 Christie, John, of Cowden, 19 Buckingham Terrace, Edinburgh  
 1874 Christie, John, West Mains, Haddington  
 1861 Christie, P., Mains of Scotsraig, Tayport  
 1857 Christie, T. C., of Bedley, Moodiesburn  
 1848 CHRISTISON, Sir Robert, Bart., M.D., 40 Moray Place, Edinburgh  
 1871 Chrystal, George, Engineer, Perth  
 1878 Chrystal, Robert, 1 Charing Cross, Glasgow  
 1873 Chrystal, William, Gilchristland, Thornhill  
 1834 Chrystie, Captain A., late H.E.I.C.S.  
 1855 Church, D. M., 25 Minto St., Edinburgh  
 1838 Church, J., Sark Tower, Canonbie  
 1859 Clapperton, Jas., Garvald Mains, Prestonkirk  
 1855 Clapperton, John, Gifford  
 1864 Clapperton, John, Gillsland, Spylaw Road, Edinburgh  
 1877 Clark, Andrew, Islay  
 1869 Clark, Archd., Bencorrum, Dunoon  
 1853 Clark, Archibald, Inverchapple, Kilmun  
 1838 Clark, Francis William, of Ulva, Aros  
 1864 Clark, James, Kirklandhill, Dunbar  
 1857 Clark, John, Flender, Busby  
 1869 CLARK, Sir John F., of Tillypronie, Bart., Tarland  
 1858 Clark, John Gilchrist, of Speddoch, Dabton, Thornhill  
 1872 Clark, John M., London  
 1867 Clark, Lachlan, Tanga, Campbeltown  
 1869 Clark, Matthew, Glasgow  
 1872 Clark, M., of Little Culmain, Crockettford, Dumfries  
 1871 Clark, Robert, Taybank House, Errol
- Admitted  
 1880 Clark, Thomas, Oldhamstocks Mains, Cockburnspath  
 1879 Clark, Thomas K., Carriage Builder, Crieff  
 1873 Clark, William, New Mowson, Belford  
 1857 Clark, William, Shawhill, Moncton  
 1871 Clark, William, Bonnygate, Cupar Fife  
 1873 Clark, Rev. Wm. Atkinson, Belford Hall Belford, Northumberland  
 1869 Clarke, John, Maryland, Uddingston  
 1873 Clarke, William, Hopewell, Tarland  
 1879 Clarkson, Alex., Pretts Mill, Thankerton  
 1854 Clay, John, Kerchesters, Kelso  
 1870 Cleghorn, Hugh, M.D., of Stravithy, St Andrews  
 1875 Clelland, James, Knockenlaw, Kilmarnock  
 1877 Clench, Fred. (Messrs Robey & Co.), Lincoln  
 1876 Clerk, Sir George Douglas, of Penicuik, Bart., Penicuik  
 1860 Clerk, Duncan, Writer, Oban  
 1875 Clarkson, Alexander, Lyden, Kirknewton  
 1871 CLINTON, Right Hon. Lord, Fettercairn House, Fettercairn  
 1850 Clouston, Peter, Glasgow  
 1871 Clyne, David, Reaster House, Wick  
 1852 COATS, Sir Peter, of Auchendrina, Ayr  
 1852 Coats, Thomas, of Ferguslie, Paisley  
 1877 Cochran, John, Low Portencallie, Stranraer  
 1877 Cochran, Robert, Caldons, Stoneykirk, Stranraer  
 1880 Cochran, Adam L., of Kingsknowes, Galashiels  
 1861 Cochran, Alexander, of Ashkirk, Hawick  
 1858 Cochran, James, Waterside Lodge, Newburgh, Aberdeen  
 1877 Cochran, James, Float, Sandhead, Stranraer  
 1866 Cockburn, Arch. D., 6 Athole Crescent, Edinburgh  
 1838 COLBROOK, Sir Thomas Edward, of Crawford, Bart., M.P., Abington  
 1843 Collier, John, Hatton House, Carnoustie  
 1857 Collyer, William D., of Cornistoun, Higgart  
 1879 Colquhoun, Dugald, Manager Vitrol Works, Carnoustie  
 1873 Colquhoun, George, Shemore, Luss  
 1872 COLQUHOUN, Sir James, of Luss, Bart., Ross-dhu, Luss  
 1876 Colquhoun, Lieut.-Col. James, Ben Crnach Lodge, Arrochar, Loch Lomond  
 1850 Colquhoun, J., Cokerhill, Pollockshaws  
 1874 Colquhoun, Rev. J. E. Campbell of Killermont, Chartwell, Westerham, Kent  
 1878 Coltart, John (of John & James Coltart, Implement Makers), Maxwelltown, Dumfries  
 1872 Coltart, Robert, Achateny, Strontian  
 1851 COLVILLE of Culross, Right Hon. Lord, K.T., 42 Eaton Place, London  
 1871 Colvin, James E., Wester Manbeen, Elgin  
 1874 Colvin, John, Solicitor, Inverness  
 1873 Common, James, Waterbeck, Ecclefechan  
 1878 Common, John, South Corriellaw, Lockerbie  
 1871 Comrie, Alex., 30 Battery Place, Rothesay  
 1874 Conacher, P. M., Gallin Cottage, Glenlyon, Aberfeldy

Admitted

- 1873 Coningham, W. J. C., late High Street, Haddington  
 1877 Connal, Michael (of Parkhall, Killearn), Glasgow  
 1878 Connell, J. W. F., of Auchencheyne, Thornhill  
 1852 Conning, John, Solicitor, Perth  
 1877 Connochie, William Dixon, V.S., Selkirk  
 1860 Constable, James, of Glencraig, Lochgally  
 1871 Cook, Charles, 17 Golden Square, Aberdeen  
 1841 Cook, John, W.S., 11 Great King Street, Edinburgh  
 1876 Cook, Thomas W., Castleton of Asloun, Alford  
 1865 Cooper, Alexander, Solicitor, Elgin  
 1845 Cooper, H. R. of Ballindalloch, Balfour  
 1874 Cooper, Wm. S., of Falford New Club, Edinburgh  
 1876 Copland, Alexander, Manager, Aberdeen, Commercial Co., Aberdeen.  
 1855 Copland, Robt., Mill of Ardlethen, Ellon  
 1864 Copland, John, Rusco, Gatehouse  
 1877 Corbett, Thos., Perseverance Iron Works, Shrewsbury  
 1840 Cordiner, W. F., Mormond House, Cortes, Lomnay  
 1878 Cormack, John F., Solicitor, Lockerbie  
 1860 Corrie, Adam, South Park, Kirkcudbright  
 1878 Corrie, Thomas, Knocklae, New Galloway  
 1864 Cotesworth, Robt., Cowdenknowes, Melrose  
 1857 Coulbrough, A., Biggarshields, Biggar  
 1875 Coulbrough, Archd., High Craigton, Milngavie  
 1852 Coulbrough, J., Blairtummoach, Lennoxton  
 1876 Coulbrough, William, Sornfallow, Wiston, Biggar  
 1859 Coupar, John, Balrownie, Brechin  
 1869 Coupar, John Cardno, of Craigiebuckler, Aberdeen  
 1865 Cousin, George, 12 Royal Exchange, Edinburgh  
 1864 Cousland, James, Glasgow  
 1853 Coutts, William, Banff  
 1864 Coventry, William, Pleasance, Aberdour, Fifeshire  
 1871 Cowan, Dr Alexander, Greenhill Lodge, Edinburgh  
 1836 Cowan, C., of Logan House, Wester Lea, Murrayfield  
 1860 Cowan, Charles W., yr. of Logan House, Penicuik  
 1875 Cowan, Daniel, 5 Oswald Street, Glasgow  
 1869 Cowan, George, Mains of Park, Glenluce  
 1872 Cowan, George, Valleyfield, Penicuik  
 1873 Cowan, James, 10 North Queen Street, Glasgow  
 1874 Cowan, James, M.P., 35 Royal Terrace, Edinburgh  
 1858 Cowan, John, of Beeslack, Milton Bridge  
 1879 Cowan, John, W.S., 12 Hill Street, Edinburgh  
 1879 Cowan, John, Metal Merchant, 21 Albert Street, Edinburgh  
 1854 Cowan, Richard, St Kilda, Sidmouth, Devon

Admitted

- 1861 Cowan, Robert, W.S., 9 Carlton Terrace, Edinburgh  
 1862 Cowan, Robert, Bank Cottage, Maryfield, Portobello  
 1872 Cowan, William, Banker, Alva  
 1870 Cowe, George, Balhousie, Carnoustie  
 1872 Cowe, Peter, Lochton, Coldstream  
 1870 Cowe, Robert, Old Castles, Chirnside  
 1872 Cowe, Wm., Butterdean, Grant's House  
 1868 Cowie, Alexander, Darley, Auchterless, Turriff  
 1853 Cowie, Alex., Crombie Bank, Ellon  
 1852 Cowie, James, Sundridge Hall, Bromley, Kent  
 1876 Cowie, James, Woodbine Cottage, Stonehaven  
 1881 Cowpar, James, Over Migvie, Kirriemuir  
 1879 Crabb, Wm., Chemical Works, Silloth, Cumberland  
 1877 Crabbie, John, of Duncow, 22 Royal Terrace, Edinburgh  
 1877 Crabbie, John M., yr. of Duncow, 33 Chester Street, Edinburgh  
 1879 Craig, Alexander, Over Milton, East Kilbride  
 1870 Craig, Daniel, Barr, Sanquhar  
 1855 Craig, David, 4 Pitt Street, Portobello  
 1875 Craig, H. V. Gibson, W.S., Lilliput Swansea  
 1850 Craig, James, 33 Manor Place, Edinburgh  
 1857 Craig, Jas., of Craigdarroch, Monktonhill, Monkton  
 1880 Craig, James, Robroyston, Bishopbriggs  
 1863 CRAIG, Sir James H. Gibson, of Riccarton, Bart., Currie  
 1857 Craig, John, Guelst, Cumnock  
 1867 Craig, John, Jellyhill, Bishopbriggs  
 1878 Craig, John, Glencairn, Oban  
 1879 Craig, John, Innergeldie, Comrie—Free Life Member  
 1860 Craig, Josh., of Threecrofts, Lochrutton, Dumfries  
 1870 Craig, Robt., Carruchan, Troqueer, Dumfries  
 1867 Craig, Robert, Auchentiber, Greenock  
 1868 Craig, Robert (Francis Lowe & Co.), Chapleton, Jamaica  
 1859 Craig, Wm., Laurel Bank, Dumfries  
 1870 Craig, Wm., Buckley, Bishopbriggs  
 1877 Craig, Dr William, 7 Lothian Road, Edinburgh  
 1855 Craig, William C., Anniston, Biggar  
 1862 Craig, W., Urquhart, Dunfermline  
 1875 Craig, William, Implement Maker, Old Meldrum  
 1880 Craig, Wm., Monktonhill, Monkton—Free Life Member  
 1873 Craighhead, James, Sillyflat, Bervie  
 1858 Craigie, William Roper, Tom-na-Droighne, Ballinluig  
 1878 Craik, George, Glentoo, Castle Douglas  
 1877 Craik, John, The Bush, Roslin  
 1863 Craike, Charles (late Esbie, Lochmaben), Australia  
 1878 Cran, George, Old Morlich, Inverkindie  
 1876 Cran, James, jun., Knockandoch, Whitehouse, Aberdeen  
 1871 Cran, John, Kirkton, Inverness

## Admitted

- 1872 Cranston, James, Holstane, Thornhill  
 1849 Cranstoun, George Cranstoun Trotter, of Dewar, Harvieston, Gorebridge  
 1859 Cranstoun, William S., Dyke, Moffat  
 1881 Craw, Henry Hewat, Foulden West Mains, Chirnside  
 1850 Crawford, Adam, Royal Terrace, Edinburgh  
 1853 Crawford, Alex., Writer, Dunse  
 1871 Crawford, Andrew, Pitlowie, Glencarse  
 1860 Crawford, D., late Dykehill, Milton of Campsie  
 1855 Crawford, Jas. Coutts, of Overton, Strathaven  
 1854 Crawford, John, The House of Tongue, Laig  
 1877 Crawford, John, High Street, Alloa  
 1865 Crawford, John, Milnstonford, West Kilbride  
 1867 Crawford, Muir, 6 Bank Street, Leith  
 1850 Crawford, P., Dumgoyack, Strathblane  
 1875 Crawford, Robert, of Lochsannish, Campbelltown  
 1866 Crawford, R., Balbougie, Inverkeithing  
 1860 Crawford, Wm., Balfargie, Perth  
 1838 Crawford, W. S. Stirling, of Milton, Glasgow  
 1866 Crease, William, 6 George Square, Edinburgh  
 1875 Crerar, Donald, Morenish, Killin  
 1861 Crerar, John, Drumathery, Dunkeld  
 1850 Creyk, Dr A., Dalvey, Advie, Strathspey  
 1838 Crichton, Hew, S.S.C., 18 Nelson Street, Edinburgh  
 1849 Crichton, Hew Hamilton, W.S., 13 Nelson Street, Edinburgh  
 1878 Crichton, James (Hamilton & Crichton), 41 George Street, Edinburgh—*Silver-smith to the Society*  
 1847 Crichton, Jas. Arthur, Advocate, Sheriff of Fife, 13 Nelson Street, Edinburgh  
 1859 Crichton, Wm., Live Stock Agent, Haddington  
 1870 Critchley, J. A., Stapelton Tower, Annan  
 1872 Croall, John, Coach Works, Kelso  
 1875 Croall, Robert, Job and Postmaster, Craigcrook Castle, Edinburgh  
 1835 Crombie, Alex., of Thornton, Laurencekirk  
 1858 Crombie, Alex., of Thornton, W.S., Albert Buildings, Edinburgh  
 1870 Cromarty, Wm., Widewall, St Margaret's Hope  
 1879 Crosbie, William, G., S.S.C., Dumfries  
 1880 Cross, Alex., 60 North Bridge, Edinburgh  
 1878 Cross, Alex., jun., Eastbank, Langbank  
 1845 Cross, David, (of Knockdon, Maybole, Seed Merchaut, Hope Street, Glasgow  
 1852 Cross, Robert, Uddingston  
 1865 Crossman, M. G., Bridgend, Berwick  
 1858 Cruickshank, Amos, Sittytton, Aberdeen  
 1868 Cruickshank, Andrew, Conland, Huntly  
 1878 Cruickshank, David, Meft, Elgin  
 1868 Cruickshank, Edward C., Lethenty, Inverurie  
 Cruickshank, George, Ardmore, Tain  
 1852 Cruickshank, George, Conisty, Huntly  
 1876 Cruickshank, James, Ladysford, Fraserburgh

## Admitted

- 1852' Cruickshank, John, Elgin  
 1875 Cruickshank, John, Dandalieith, Craigelachie  
 1876 Cruickshank, John W., Lethenty, Inverurie  
 1876 Cruickshank, Wm., Cainglass, Lomnay, Aberdeen  
 1865 Cram, Alex., Thornliebank House, M.P., Thornliebank, Glasgow  
 1876 Cullen, Archd., Woodend, Airvirie  
 1879 Cumming, David, Knockieston, Crieff  
 1868 Cumming, George, Writer, Banff  
 1865 Cumming, Henry Gordon, Pittyvaich, Duftown  
 1874 Cumming, Jas., Allanfeearn, Inverness  
 1876 Cumming, William, V.S., Alnwiek  
 1874 Cumming, Sir William G. Gordon, of Altyre, Bart., Forres  
 1850 Cuninghame, D., Chapelton, Ardrossan  
 1880 Cuninghame, J. C., of Craigends, Johnstone  
 1866 Cuninghame, R. D. B., of Hensol, Castle Douglas  
 1880 CUNNINGHAME, Sir William M., of Corsehill, Bart., Glenmoor House, Maybole  
 1854 Cunningham, A. G., Rosebank, Currie  
 1870 Cunningham, C. V.S., Slateford  
 1872 Cunningham, C. J., of Muirhouselaw, The Tofts, Morebattle, Kelso  
 1879 Cunningham, David, Burntisland  
 1864 Cunningham, J., Tarbreoch, Dalbeattie  
 1864 Cunningham, J. C., 102 West Bow, Edinburgh  
 1879 Cunningham, James William Brodie, Grahamslaw, Kelso  
 1867 Cunningham, John, Trees, Maybole  
 1879 Cunningham, John, Burntisland  
 1857 Cunningham, J., Whitecairn, Dalbeattie  
 1864 Cunningham, J. M., Manager Clydesdale Banking Company, Glasgow  
 1851 Cunningham, T., Dalachy, Aberdour  
 1836 Cunningham, W. A., of Logan, Cunnock  
 1859 Cunningham, W. C. S., of Caprington, Kilmarnock  
 1867 CUNNINGHAM, Sir Robert K. A. Dick, of Prestonfield, Bart., Edinburgh  
 1871 Curr, Henry, Pitkellony House, Muthill  
 1880 Curr, James, 32 Charlotte Square, Edinburgh  
 1853 Currie, James, Eastwood, Gorebridge  
 1872 Currie, James J., Torralia, Gorebridge  
 1879 Currie, John, Kirkeoch, Kirkcudbright  
 1863 Currie, William, of Lintill, St Boswells  
 1854 CURRIEHILL, Hon. Lord, 6 Randolph Crescent, Edinburgh  
 1877 Curror, Adam Henry, Edinburgh  
 1867 Curror, David, of Wester Craiglockie, 25 Northumberland Street, Edinburgh  
 1848 Curror, John, of Nivingston, Colinton Mains, Colinton  
 1869 Curror, John F., Damhead, Murrayfield  
 1873 Curror, Patrick Robert, Myreside, Edinburgh  
 1872 Curror, Peter, Coxithill, Stirling  
 1836 Cuthbertson, William, Merchant, Glasgow  
 1874 Dahl, Ferdinand August, Director of the Royal Higher Agricultural School at Aas, Christiania—*Honorary Associate*

Admitted

- 1876 Dakers, James, 24 Union Row, Aberdeen  
 1875 Dalgleish, George, Rosebery Mains, Temple  
 1887 Dalgleish, John J., of Ardnarmurchan, 8 Athole Crescent, Edinburgh  
 1888 Dalgleish, L., of Pittfirrane, 22 Coates Crescent, Edinburgh  
 1879 Dalgleish, William Ogilvy of Mayfield, Dundee  
 1876 DALHOUSIE, Right Hon. the Earl of, Dalhousie Castle, Bonnyrigg  
 1853 DALKEITH, Right Hon. the Earl of, K.T., Eildon Hall, Newtown St Boswells  
 1874 Dallas, A. G., 10 Tervor Terrace, London, S.W.  
 1875 Dangerfield, Edward, Balboughty, Perth  
 1882 Dalrymple, Charles, of Hailes, M.P., 398 Onslow Square, London, S.W.  
 1868 Dalrymple, C. Elphinstone, of Kinellar Lodge, Blackburn, Aberdeen  
 1865 DALRYMPLE, Hon. G. Grey, Ellistoun House, St Boswells  
 1841 DALRYMPLE, Sir Hew, of North Berwick, Bart., Luchie, North Berwick  
 1857 Dalrymple, James, of Woodhead, Kirkintilloch  
 1866 DALYELL, Sir R. A. O., of Binns, Bart.  
 1878 Dalziel, Adam, Arkland, Penpont  
 1860 Dalziel, Alex., Glenwharrie, Sanquhar  
 1860 Dalziel, George, Merkland, Thornhill  
 1870 Dalziel, George, Auchengruth, Sanquhar  
 1873 Dalziel, George, W.S., 25 Drumshugh Gardens, Edinburgh  
 1869 Dalziel, James, Tinwaldshaws, Dumfries  
 1878 Dalziel, Robert, Druidhall, Penpont  
 1857 Darling, Adam, Governor's House, Berwick  
 1880 Darling, Thomas, Governor's House, Berwick  
 1839 Darling, William, Priestlaw, Cranshaws  
 1865 Darroch, D., of Gourrock, Torridon, Achnasheen  
 1855 Davidson, Alexander, Mains of Cairnbrogie, Old Meldrum  
 1878 Davidson, David, 71 English Street, Dumfries  
 1881 Davidson, Donald, Drummond Park, Inverness  
 1824 Davidson, Duncan, of Tulloch, Dingwall  
 1864 Davidson, Duncan H. C. R., yr. of Tulloch, Brae, Dingwall  
 1860 Davidson, George, Walton, Linlithgow  
 1880 Davidson, George, Banchory, Kinghorn  
 1870 Davidson, Gilbert, Banker, Hawick  
 1848 Davidson, H., of Muirhouse, Davidson's Mains, Edinburgh  
 1841 Davidson, Henry M., Sheriff-Clerk, Haddington  
 1870 Davidson, Hugh, of Braedale, Lanark  
 1864 Davidson, J., North Leys, Banchory  
 1877 Davidson, James J., Dean Park, Balerno  
 1874 Davidson, Lachlan, Caledonian Bank, Kingussie  
 1834 Davidson, P., of Inchmarlo, Banchory  
 1865 Davidson, Robert, Mayfield, Inverness  
 1872 Davidson, Wm., Colmslie, Galashiels  
 1850 Davidson, William J., of Ruchill, 32 Drumshugh Gardens, Edinburgh

Admitted

- 1848 DAVIE, Sir H. R. F., of Creedy, Bart., Crediton, Devon  
 1859 Dawson, John, Thurleigh, Bedfordshire  
 1876 Dawson, William, Westerton, Fochabers  
 1878 Dayton, Robert, The Hotel, Lochearnhead  
 1876 Dean, George, Brangan, Boyndie, Portsoy  
 1857 Deans, J. Y., of Kirkstyle, Kilmarnock  
 1850 Deans, Peter D., Mount Charles, Portobello  
 1878 Deans, William, The Glen, Innerleithen  
 1838 DEAS, Hon. Lord, 32 Heriot Row, Edinburgh  
 1823 Dempster, G., Ormiston Hall, Tranent  
 1854 Denholm, Alex., Bailtaws, Lamington  
 1877 DENMAN, Right Hon. Lord, Alderston, Haddington  
 1850 Dennistoun, Alexander H., of Golfhill, Glasgow  
 1877 Dennistoun, James Wallis, of Dennistoun, The Hangingshaw, Selkirk  
 1875 Dent, Irvine, Ravensnook, Penicuik  
 1864 Dewar, A., Arnprior, Kippen, Stirling  
 1872 Dewar, David, Shaw of Touch, Stirling  
 1873 Dewar, James, Cairnston, Dunblane  
 1872 Dewar, James, 40 Windsor Terrace, St George's Road, Glasgow  
 1877 Dewar, James Cumming, of Vogrie, Ford  
 1873 Dewar, John, Doune Castle Farm, Doune  
 1864 Dewar, Peter, King's Park, Stirling  
 1864 Dewhurst, G. C., of Aberuchil, Comrie  
 1856 Dick, Dr John, 19 Dalrymple Crescent, Edinburgh  
 1868 Dick, Wm., of Tullymet, Ballinluig  
 1859 Dickenson, Wm., Longcroft, Lauder  
 1869 Dickie, Joseph, Union Bank, Dunkeld  
 1867 Dickie, Robt., Killisnoan, Campbeltown  
 1870 Dickie, William, Audsley House, Langford, Derbyshire  
 1869 Dickinson, George T., of Wheelbirks, Newcastle-on-Tyne  
 1870 Dickson, Alex., of Hartree and Kilbucho, M.D., Professor of Botany, University of Edinburgh, 11 Royal Circus  
 1854 Dickson, Archibald, Hassendeanburn, Hawick  
 1879 Dickson, George, Currielen, Ormiston  
 1850 Dickson, James J., C.A., 13 Clarendon Crescent, Edinburgh  
 1858 Dickson, James A., Woodville, Arbroath  
 1862 Dickson, J. H., of Corstorphine, Saughton Mains, Edinburgh  
 1848 Dickson, John, W.S., Greenbank, Perth  
 1858 Dickson, John F., Panbride House, Carnoustie  
 1876 Dickson, Patrick, Laurencekirk  
 1870 Dickson, R. A., Merchant, Dumfries  
 1860 Dickson, T., Drumcrail, Thornhill  
 1879 Dickson, Thomas Goldie, 3 North St David Street, Edinburgh  
 1871 Dickson, Dr Walter G., 3 Royal Circus, Edinburgh  
 1874 Dickson, W. L., Drummelzier Haugh, Biggar  
 1878 Dickson, William Traquair, W.S., 11 Hill Street, Edinburgh  
 1851 Dingwall, William, Ramornie, Ladybank

## Admitted

- 1863 Dinning, John, The Terrace, Belford, Northumberland  
 1879 Dinwiddie, Wm. A., Manufacturer, Greenbrae, Dumfries  
 1849 Dixon, Thomas G., Nant Hall, Rhyl  
 1866 Dobbie, John, Campend, Dalkeith  
 1862 Dobie, David, Tinwald House, Dumfries  
 1878 Dobie, David, Banker, Lockerbie  
 1878 Dobie, Douglas, Drumcork, Thornhill  
 1863 Dodd, Nicholas, Nisbet, Kelso  
 1863 Dodd, James, Mossburnford, Jedburgh  
 1837 Dodd, William, Merchant, Glasgow  
 1857 Doddrell, George J., 51 Belmont Terrace, Hillhead, Glasgow  
 1865 Dodds, James, Moncrieff Bank, Perth  
 1844 Dodds, J., Cranston Riddell, Dalkeith  
 1877 Dodds, Samuel, Somnerfield, Haddington  
 1863 Dodds, William, Elwarthlaw, Greenlaw  
 1871 Doe, John, Agricultural Implement Maker, Errol  
 1880 Dollar, Thomas A., 56 New Bond Street, London  
 1858 Don, Alex., Keirsbeath, Dunfermline  
 1877 Donald, Andrew, Spittal, Penicuik  
 1858 Donald, Jas., Deebank Cottage, Crathes, Aberdeen  
 1878 Donald, James Forbes, Annan  
 1877 Donald, John, 49 Forrest Road, Edinburgh  
 1876 Donaldson, Alex., 54 Avenue Wagram, Paris  
 1871 Donne, Henry, Leek Wootten, Warwick  
 1865 Dougall, Adam, Stewarton, Kirkcinner  
 1866 Dougall, Andrew, Railway Manager, Inverness  
 1857 Dougall, Admiral W. H. Maitland, R.N., of Scotsraig, Tayport  
 1875 Douglas, Mrs. Green, Kilmalcolm  
 1868 Douglas, Archibald C., of Mains, Milngavie  
 1868 Douglas, Arthur Henry Johnstone, of Lockerbie  
 1858 Douglas, Bentlem, Peffer Mill, Liberton  
 1866 Douglas, E. O., of Killiechassie, Aberfeldy  
 1839 Douglas, F. B., Advocate, 21 Moray Place, Edinburgh  
 1851 DOUGLAS, Sir Geo. H. S., of Springwood Park, Bart., Kelso  
 1871 Douglas, George, Upper Hindhope, Jedburgh  
 1867 Douglas, George Sholto, Berryhill, Kelso  
 1873 Douglas, John, Marionburgh, Ballindalloch  
 1861 Douglas, Thomas, Clyth, Wick  
 1872 Douglas, Thos., Swinside Townhead, Jedburgh  
 1874 Douglas, William, Arboll, Fearn  
 1878 Douglas, William D. Robinson, of Orchardton, Castle-Douglas  
 1854 Douglass, Alex. Forbes, Haddo House Mains, Aberdeen  
 1864 Douie, John R. L., Factor, Polmaise, Stirling  
 1853 Dove, John, Kelso  
 1879 Dow, David, Balmanno, Bridge of Earn  
 1879 Dow, David, jun., Balmanno, Bridge of Earn

## Admitted

- 1879 Dow, James, Clathybeg, Gask, Auchterarder  
 1871 Dowall, Charles, Kelly Bleachfield, Arbroath  
 1858 Dowell, Alex., 13 Palmerston Place, Edinburgh  
 1878 Downie, George, Balcomie, Craighall  
 1869 Downie, Hay, Corstorphine  
 1867 Downie, Wm., Kinbroom, Rothienorman  
 1857 Drennan, James, Auchenclee, Ayr  
 1872 Drever, James, Askernish, South Uist, Lochmaddy  
 1870 Drew, James, of Craigenallie, Doonhill, Newton-Stewart  
 1850 Drew, Lawrence, Merryton, Hamilton  
 1857 Drife, James, New Zealand  
 1861 Dron, William, Crieffvachter, Crieff  
 1861 DRUMMOND, Hon. Francis, 58 St George's Square, London, S.W.  
 1873 Drummond, James, jun., Blacklaw, Dunfermline  
 1859 Drummond, Henry, Seedsman, Stirling  
 1864 Drummond, John, of Balquhandy, late Gullton Rectory, Wingham, Kent  
 1871 Drummond, John, of Blackruthven, Perth  
 1852 Drummond, J. M., of Megginch, Errol  
 1875 Drummond, Robert, Pocknave, Craigie, Kilmarnock  
 1828 Drummond, Thomas, of Craigie, Dundee  
 1870 Drummond, W. P., 82 George Street, Edinburgh  
 1858 Drybrough, Thos., 31 Royal Terrace, Edinburgh  
 1869 Dryburgh, J., Kininmonth, Cupar-Fife  
 1863 Dryden, W., Land-Steward, Springwood Park, Kelso  
 1881 Drysdale, A. L., Kilmux, Kennoway, Fife  
 1873 Drysdale, David, Lorns Hill, Alloa  
 1864 Drysdale, Henry, Begbie, Haddington  
 1873 Drysdale, Robert, Old Mills, Craigforth, Stirling  
 1861 Drysdale, Wm., of Kilrie, North Pittendie, Kinghorn  
 1879 Duckering, C. E., Northorpe, Kirtou Lindsey  
 1879 Duckering, W., Northorpe, Kirtou Lindsey  
 1870 Dudgeon, Alex., East Dalmeny, Edinburgh  
 1869 Dudgeon, George, Almondhill, Kirkcaldy  
 1850 Dudgeon, James, Upper Keith, Edinburgh  
 1840 Dudgeon, John, 17 Kensington Gate, London  
 1862 Dudgeon, J. S., Longnewton, St Boswells  
 1856 Dudgeon, John B., Crakaig, Golspie  
 1851 Dudgeon, Patrick, of Cargen, Dumfries  
 1877 Dudgeon, Robert F., yr. of Cargen, Dumfries  
 1843 DUDLEY, Right Hon. the Earl of, Dudley House, Park Lane, London  
 1866 DUFF, Hon. George Skene, Montcoffer House, Banff  
 1874 Duff, George Smyttan, Sanquhar House, Forres  
 1868 Duff, Col. James, Knockleith, Turriff

Admitted

- 1875 Duff, James, Factor, Blackwood, Lesmahagow  
 1865 Duff, James, Freeland, Bridge of Earn  
 1858 Duff, Lachlan Duff Gordon, of Drummuir, Kelso  
 1866 Duff, Robert W., of Fetteresso, M.P., Stonehaven  
 1874 Duff, Thomas, late of Garth, Aberfeldy  
 1880 Duff, Thomas Gordon, Park House, Banff  
 1877 Duff, Wm., late Tayfarm, Meikleour  
 1858 Duguid, P., of Cammachmore, Aberdeen  
 1880 Dun, Finlay, 2 Portland Place, London, W.  
 1871 Dun, John, jun., Galashiels  
 1839 DUNBAR, Sir Archd., of Northfield, Bart., Duffus House, Elgin  
 1876 Dunbar, Garden Duff, of Hempriggs, Ackergill Tower, Wick  
 1845 DUNBAR, Sir William, of Mochrum, Bart., 35 Princes Gardens, London, S.W.  
 1876 Dunbar, William, Union Bank, Turriff  
 1861 Duncan, Alex. (of Providence, Rhode Island), Knossington Grange, Oakham, Rutland  
 1857 Duncan, Alex., Craigfoodie, Cupar Fife  
 1878 Duncan, Alex., Duart, Auchnacraig, Mull  
 1875 Duncan, Alex. R., yr. of Parkhill, Blairquosh, Strathblane  
 1876 Duncan, Charles, Advocate, Deebank, Murtle, Aberdeen  
 1872 Duncan, Charles, of Meadowcap, Woodhead, Rothesay  
 1853 Duncan, D. H., Frick Main, Arbroath  
 1868 Duncan, James, New Zealand  
 1869 Duncan, James, Panlathie Mill, Carnoustie  
 1871 Duncan, James, of Benmore, Kilmun, Greenock  
 1875 Duncan, James, Bannatyne Mains, Rothesay  
 1871 Duncan, John, yr. of Kinkell, Brownhills, St Andrews  
 1879 Duncan, John, of Dullatur, Newbigging, Carnock, Dunfermline  
 1853 Duncan, John, Ardo, Methlic  
 1877 Duncan, John, Fortrie, King Edward, Banff  
 1877 Duncan, Patrick, Balchers, King Edward, Banff  
 1879 Duncan, Patrick Geekie, East Memus, Kirriemuir  
 1855 Duncan, Robert, of Kirkmay, Orail  
 1868 Duncan, R., Auchenalddie Mains, Banff  
 1881 Duncan, Robert, Royal Hotel, Tigh-na-bruaich  
 1848 Duncan, William, S.S.C., 13 Abercromby Place, Edinburgh  
 1876 Duncan, William, 18 York Place, Edinburgh  
 1881 Duncan, Walter Geekie, Balkemback, Tealing, Dundee  
 1868 Duncan, W. J., National Bank, Edinburgh  
 1876 Dundas, Chas. Henry, Dunira, Crief  
 1878 Dundas, Ralph, W.S., 16 St Andrew Square, Edinburgh  
 1847 Dundas, Robert, of Arniston, Gorebridge  
 1880 Dundas, T. G., of Carron Hall, Larbert

Admitted

- 1880 Dundas, Wm. John, C.S., 16 St Andrew Square, Edinburgh  
 1860+ DUNGLASS, Right Hon. Lord, Newton Don, Kelso  
 1857 Dunlop, Alexander, Glasgow  
 1876 Dunlop, Colin Robert, of Quarter, Hamilton  
 1869 Dunlop, Gabriel, Castle Farm, Stewarton  
 1872 Dunlop, George, W.S., 14 George Street, Edinburgh  
 1875 Dunlop, Quintin, Morriston, Maybole  
 1871 Dunlop, Robert, Aulton, Kilmaurs  
 1853 Dunlop, Wm. H., of Annanhill, Kilmarnock  
 1862+ DUNMORE, Right Hon. the Earl of, Dunmore Park, Stirling  
 1854 Dunn, Adam, Tranent Mains, Tranent  
 1880 Dunn, Andrew, jun., Kelso  
 1863 Dunn, David, 76 Liverpool Road, Birkdale, Southport  
 1876 Dunn, John, Ramsay Lodge, Kelso  
 1877 Dunn, Malcolm, The Gardens, Dalkeith  
 1877 Dunn, Robert, Ballykelly, Londonderry  
 1880 Dunn, Robert, Belford  
 1878 Dunn, Wm., Kenmore Mains, Aberfeldy  
 1858 Durie, David, Nether Mill, Fettercarn  
 1855 Durie, Robert Hogg, Barney Mains, Haddington  
 1879 Durno, James, Jackston, Rothenorman  
 1863 Durno, John, Lambhill, Inch  
 1874 Durno, John, Sunnyside, Rothenorman  
 1880 Durward, John, Luib, Corgarff, Strathdon  
 1868 Duthie, William, Banker, Tarves  
 1878 Dykes, James, Quicken, Penicuik  
 1869 Dykes, John, jun., 79 St Vincent Street, Glasgow  
 1875 Dykes, Robert, Laigh Hillhouse, Troon  
 1879 Dykes, Thomas, London  
 1832 Dyson, Thos. C., of Willowfield, Halifax, Yorkshire  
 1871 Easson, David, Camperdown, Dundee  
 1860 Easson, Robt., Scoones, Lethendy, Perth  
 1865 Eden, Right Rev. Bishop, Hedgefield House, Inverness  
 1871 Eden, Henley, Maiden Bradley, Bath  
 1874 Edgar, John, Kirkcaldy, Roslin  
 1871 Edgley, Robert, Gilmerton, Edinburgh  
 1857 Edgley, Thomas, Gilmerton, Edinburgh  
 1864 Edgington, Peter, Thornhill, Muthill  
 1869 Edmond, David, of Ballochruin, Balfour  
 1877 Edmond, Alex., yr. of Kingswells, Garthdee, Aberdeen  
 1881 Edmond, John, Gallamuir, Bannockburn  
 1873 Edmond, Wm., Cowie, Bannockburn  
 1873 Edmond, William, Hillhead of Catter, Drymen  
 1858 Edmonds, Leonard, London  
 1878 Edmonston, Thomas, Sackville Street, Portland, Street, Manchester  
 1869 Edmonston, D. C., Ordale, Baltasound, Unst, Lerwick  
 1875 Edmonston, Mrs. of Bunes, Lerwick  
 1873 EDMONSTONE, Admiral Sir William, of Duntreath, Bart., Strathblane  
 1859 Edwards, Matthew, late Hilton, Alloa  
 1863 EGLINTON and WINTON, Right Hon. the Earl of, Eglington Castle, Irvine

## Admitted

- 1847 ELCHO, Right Hon. Lord, M.P., Gosford, Haddington  
 1881 Elder, Hugh, Grain Merchant, Dunfermline  
 1881 Elder, Hugh, East Bearford, Haddington  
 1854 Elder, Jas., Whitehill Mains, Musselburgh  
 1877 Elder, James, Roddinglaw, Currie.  
 1854 Elder, Thos., Wedderburn Mains, Edrom  
 1854 Elder, William, Tweedmouth Implement Works, Berwick-on-Tweed  
 1878 Eley, the Rev. Dr Wm. Henry, Etchingham Rectory, Hawkhurst, Kent—*Free Life Member.*  
 1875 ELGIN and KINCARDINE, Right Hon. the Earl of, Broomhall, Dunfermline  
 1874 ELPHINSTONE, Right Hon. Lord, Darnhall, Eddleston  
 1875 ELLESMERE, Right Hon. the Earl of, Worsley Hall, Manchester  
 1869 Elliot, A. T., Newhall, Galashiels.  
 1853 Elliot, James, Galalaw, Kelso  
 1880 Elliot, James, Burnhead, Hawick  
 1875 Elliot, James T. S., younger of Wolflee, Hawick.  
 1854 Elliot, John, Primrosehill, Dunse  
 1880 Elliot, John, of Binks, Burnmouth, Newcastleton  
 1863 Elliot, John, The Flat, Newcastleton  
 1874 Elliot, Matthew, Flesher, Inverness  
 1848 Elliot, Robert, East Nisbet, Jedburgh  
 1874 Elliot, Robert Henry, of Clifton Park, Kelso  
 1852 Elliot, Thomas, Hindhope, Jedburgh  
 1854 Elliot, Thomas, Blackhaugh, Galashiels  
 1873 Elliot, Thos. John, Bridge House, Southwick, Fareham, Hants—*Free Life Member.*  
 1861 ELLIOT, Sir Walter, of Wolfelee, K.C.S.I., Hawick  
 1860 Elliot, Walter, Hollybush, Galashiels  
 1866 Elliot, Walter, Hermitage, Newcastleton  
 1872 Elliot, Wm. B., of Benrig, St Boswells  
 1880 Ellis, O. W., (Robey & Co.), 26 George Street, Edinburgh  
 1871 Ellison, Ralph Carr, of Dunstan Hill, Gateshead  
 1869 ELPHINSTONE, Right Hon. Lord, Carberry Tower, Musselburgh  
 1867 ELPHINSTONE, Hon. Edward Chas. Buller, Carnock House, Larbert  
 1840 ELPHINSTONE, Sir James D. H., of Horn and Logie Elphinstone, Bart., Pitcaple  
 1854 ERROL, Right Hon. the Earl of, Slains Castle, Elton  
 1878 Erskine, Charles, Chiefswood, Melrose  
 1874 Erskine, Henry, care of Wm. Kinnear, North Water Bridge, Laurencekirk—*Free Life Member*  
 1862 Erskine, H. D., of Cardross, Stirling  
 1862 Erskine, J. E., of Linlathen, Broughty-Ferry  
 1859 Erskine, Vice-Admiral John E., The Albany, London  
 1860 ERSKINE, Sir Thomas, of Cambo, Bart., St Andrews  
 1873 Eskdale, John, Muirdean, Kelso  
 1875 Ewart, H., Tynninghame, Prestonkirk  
 1858 Ewen, Robert, West Town, Tarland

## Admitted

- 1857 Ewing, Alex., Crum, yr. of Strathleven, Glasgow  
 1851 Ewing, Archd. Orr, of Ballikinnain, M.P., Killearn  
 1857 Ewing, Humphrey Ewing, Crum, of Strathleven, Ardencaple Castle, Helensburgh  
 1868 Fair, Frederick, late St Andrews  
 1863 Fair, John S. Elliot, Wells, Jedburgh  
 1864 Fairholme, Geo. K. Erskine, of Old Melrose.  
 1881 Fairrie, John, Merchant, London  
 1858 Falconar, Donald, Milton of Canon, Arbrough  
 1873 Falconer, Wm., Cairnton, Fordoun  
 1849 FALSHAW, Sir James, Bart., 14 Bel Crescent, Edinburgh  
 1860 Farish, Samuel, Kirklands, Lockerbie  
 1877 Farish, Samuel T., jun., Kirklands, Lockerbie  
 1877 Farish, Wm. R., Tinwald Parks, Dumfries  
 1852 Farquhar, Arthur, W.S., 10 Forrest Road, Aberdeen  
 1876 Farquhar, Captain, of Glenask, Turriff  
 1880 Farquhar, James, Old Elch, Elch  
 1877 Farquharson, Fras. Charles, Banker, Auchinblae  
 1865 Farquharson, Colonel James Ross, of Invercauld, Braemar  
 1865 Farquharson, J., 4 Bridge Street, Aberdeen  
 1852 Farquharson, James, of Glenfarquhar, Auchinblae  
 1871 Farquharson, James, East Town, Tarland  
 1843 Farquharson, Major-General Francis  
 1857 Farquharson, Robert O., of Haughton, Alford  
 1858 Farrell, Alfred Herbert William, Davo House, Fordoun  
 1878 Farrell, John Arthur, Moynalty, Kells, Meath, Ireland  
 1857 Farrell, M., of Woodburnden, Fordoun  
 1874 Fell, John Duncan, Flesher, Blairgowrie  
 1863 Fender, Robert, Northfield, Coldingham  
 1877 Fennessy, Thos., Grange Villa, Waterford, Ireland  
 1872 Fenwick, James, Leadketty, Dunning  
 1871 Fenwick, Jas., Factor, Raulgorton, Perth  
 1874 Fergus, William (Craigour, Liberton), 1 Queen's Place, Leith Walk, Edinburgh  
 1876 Ferguson, Archd. A. Gosfield, Kew—*Free Life Member*  
 1871 Ferguson, Lieut.-Col. George A., of Pitfour, Mintlaw  
 1879 Ferguson, James, Balunie, Coupar-Angus  
 1875 Ferguson, John, Banker, Carnwath  
 1863 Ferguson, John, Burghlee, Loanhead  
 1855 Ferguson, John, Lossiemouth  
 1846 Ferguson, J., of Kilquhanity, Dalbeattie  
 1870 Ferguson, John, Seed Merchant, Sanquhar  
 1879 Ferguson, John, Kipperoch Farm, Dumbarton  
 1875 Ferguson, Peter, Rock Cottage, Renfrew

Admitted

- 1858 Ferguson, Thomas, Kinnochtry, Coupar-Angus  
1868 Ferguson, Thomas, Union Terrace, Aberdeen  
1870 Ferguson, Wm., of Kinmundy, 21 Manor Place, Edinburgh  
1879 Ferguson, W. S., Pictston Hill, Perth  
1879 Fergusson, Donald, Dalcapon, Ballinluig, Perthshire  
1854 Fergusson, Right Hon. Sir James of Kilkerran, Bart., Maybole  
1878 Fergusson, Ninian, Goosehill, Sanquhar  
1836 Fergusson, Samuel R., of Middlehaugh, Pitlochry  
1878 Fergusson, Wm., Donkins, Ecclefechan  
1870 Ferme, Charles, late Blackhall, Tullihallan, late Kincardine-on-Forth  
1869 Ferrie, George, Leigham Lodge, Roupell Park, Streatham Hill, Surrey  
1875 Ferrie, James A., Hilton, Alloa  
1853 Ferrie, J. C., Union Club, St Andrews  
1878 Ferrier, Alexander, (Ferrier Brothers), 55 Hope Street, Glasgow  
1864 Field, Rev. Edward Burch, of Moreland, 6 Glencairn Crescent, Edinburgh  
1869 Field, Sydney, Scotstoun House, Aberdeen  
1879 Findlater, James Smith, Balvenie, Dufftown  
1857 Findlay, Colonel John, Woodbank, Alexandria, N.B.  
1855 Findlay, Robert, of Springhill, Bailieston, Glasgow  
1880 Findlay, Robert Elmsall, of Boturich, Alexandria, N.B.  
1847 Findlay, Thomas Dunlop, Easterhill, Glasgow  
1857 Findlay, W., Brackenbrae, Bishopbriggs  
1844 Finlay, A. S., of Castle Toward, Greenock  
1859 Finlay, John, Lochend, Lochgelly  
1869 Finlay, John H., W.S., 13 Castle Street, Edinburgh  
1870 Finlay, Kirkman, of Dunlossit, Portasknig, Islay  
1874 Finnie, Wm., of Newfield, Kilmarnock  
1874 Fisher, Arthur Wm., Reay House, Inverness  
1873 Fisher, Donald, Jellyholm, Alloa  
1861 Fisher, Donald, The Hotel, Pitlochry  
1878 Fisher, Henry, Balbeuchly, Dundee  
1870 Fisher, John, Knells, Carlisle  
1877 Fiskun, Thomas Robert Hay, Delamere Villas, Dewsbury Road, Leeds  
1861 Fleming, Alex., Raith, Bothwell  
1852 Fleming, Andrew, Mains of Fulwood, Paisley  
1867 Fleming, David, Avonmill, Hamilton  
1876 Fleming, David Gibson, Ardullie, Dingwall  
1878 Fleming, Gavin, Crowdie Knowe, Ecclefechan  
1869 Fleming, George, Crofthead, Mid-Calder  
1854 Fleming, James, Three-Mile-Town, Linlithgow  
1864 Fleming, James, Carmuir, Falkirk  
1877 Fleming, John, Ploughland, Strathaven  
1865 Fleming, J., Bombay  
1870 Fleming, John, Meadowbank Cottage, Strathaven

Admitted

- 1875 Fleming, John, Woodside, Rutherglen  
1876 Fleming, J. B., of Beackonfield, 241 St Vincent Street, Glasgow  
1857 Fletcher, Archibald, late Tyndrum  
1870 Fletcher, Bernard Jas. C., of Somerton Hall, Norfolk  
1848 Fletcher, Major C. E., late of Corsock  
1865 Fletcher, James, of Rosehaugh, Avoch  
1857 Fletcher, J., of Salton, Tranent  
1875 Fletcher, John, Bangour, Uphall  
1872 Flint, Alex., Nether Mains, Chirnside  
1869 Flint, David, Drylaw Mains, Davidson's Mains  
1861 Flockhart, J., Banker, Colinsburgh  
1865 Foggo, Robert Gordon, Invercauld Office, Ballater  
1872 Forbes, Right Hon. Lord, Castle Forbes, Keig  
1876 Forbes, Alex., Pitfourie, Pitlochry  
1876 Forbes, Arthur Edward Whitmore, Campsea Asha, Wickham Market  
1856 Forbes, Charles William, late Moniack Castle, Inverness  
1870 Forbes, Chas. W. L., Aberfeldy  
1830 Forbes, George, Merchant, London  
1865 Forbes, Duncan, of Culloiden, Inverness  
1862 Forbes, James Ochonar, of Corse, Lumphann  
1874 Forbes, James, Tombrack, Glenbucket, Aberdeen  
1842 Forbes, Major-General John, of Inverernan, C.B., Strathdon  
1872 Forbes, John, Pitellachie, Coldstone, Dinnet, Aberdeenshire  
1880 Forbes, Thomas, Road Surveyor, Mid-Calder  
1857 Forbes, Sir William, of Craigievar, Bart., Fintray House, Aberdeen  
1835 Forbes, W., of Medwyn, 17 Ainslie Place, Edinburgh  
1860 Forbes, William, of Callendar, Falkirk  
1874 Forbes, William Forbes, of Lochcote, 3 Chapel Place, Vere Street, Oxford Street, London  
1878 Ford, George, Saughton Hall Mains, Murrayfield, Edinburgh  
1849 Ford, Wm., Fenton Barns, Drem  
1878 Ford, William, of Fernyeside, Liberton  
1868 Fordyce, James Dingwall, of Culsh, Advocate, 34 Great King Street, Edinburgh  
1871 Forgan, Andrew, Barnhill, Broughty Ferry  
1873 Forgan, James, Sunnysbraes, Leven  
1831 Forman, Jn. Nairne, W.S., 8 Heriot Row, Edinburgh  
1868 Forman, John (Duncrahill), 51 Great King Street, Edinburgh  
1852 Forman, Robert, Keith House, Upper Keith  
1857 Forrest, David, of Treesbanks, Shotts  
1880 Forrest, George, Edston, Stobo, Peebles  
1843 Forrest, James jun., Kierriemuir  
1870 FORREST, Sir John, of Comiston, Bart., 18 Manor Place, Edinburgh  
1867 Forrest, John Clark, of Auchennaith, Hamilton  
1863 Forrest, Peter, of Hairmyres, Shotts



Admitted	Admitted
1863 Forrest, William, of Lawmuir, Allanton, Hamilton	1854 Fraser, Patrick Allan, of Hospitalfield, Arbroath
1842 Forrester, John, W.S., 8 Drummond Place, Edinburgh	1868 FRASER, The Hon. Lord, 8 Moray Place, Edinburgh
1865 Forsyth, David, Town Clerk, Elgin	1839 Fraser, Robert, Brackla, Nairn
1872 Forsyth, Jas. (Hooper & Co.), Kelso	1850 Fraser, W. S., Banker, Dornoch
1874 Forsyth, Jas. Noel Muller, of Quinish, Tobermory, Mull	1852 Fraser, William, of Kilmuir and Newton, Nairn
1878 Forsyth, John, Riffer Park, Sorbie	1861 Fraser, Wm., Greenhill, Dumfries
1855 Forsyth, John, Auchoyle, Parkhill	1865 Fraser, Wm., Annfield, Inverness
1878 Forsyth, Walter, Whitlee, Corslee, Stow	1859 Fraser, John, Overton, New Abbey, Dumfries
1874 Forsyth, William Banks, of the <i>Inverness Advertiser</i> , Inverness	1857 Frederick, D., of Gass, Dumbredgen, Stranraer
1873 Fortescue, Archer, of Swanbister and Kingcausie, Aberdeen	1869 Frederick, Robert, Drumflower, Glenluce
1857 Fortune, George, Barnsmuir, Crail	1877 Frederick, Thomas, Cairnhandy, Stoneykirk, Stranraer
1854 Fortune, William R., of Muircambus, Colinsburgh	1868 Freeland, Jas., Broadgate, Strathblane
1878 Fotheringham, Richard P., Seedsman, Dumfries	1855 French, James, Sortkjoer, Fredericks-haven, Denmark
1877 Foulis, David, 61 George Street, Edinburgh	1877 French, James, Mountherrick, Abington
1869 FOULIS, Sir James Liston, of Colinton, Bart., St Andrews	1870 French, Thomas, Netherton, Abington
1871 Foulis, Dr Robert, of Cairney Lodge, Cupar-Fife	1867 Frew, Thomas, 67 Great Western Road, Glasgow
1875 Foulds, A. R., of Clerkland, Stewarton	1854 Friar, Thomas, of Grindon Ridge, Norham-on-Tweed
1870 Foulds, James, Cavens, Dumfries	1875 Frier, Matthew, Kidston Mill, Peebles
1866 Fowler, Henry Mackenzie, of Raddery, Fortrose	1873 Fryer, John J., Music-seller, Dumfries
1874 Fowler, William, of Asleed, Turriff	1879 Fullarton, James, Balgove, Coupar Angus
1849 Fox, Michael, jun., late Glencorse Mains, Penicuik	1857 Fulton, Andrew, 86 George Street, Edinburgh
1838 Fox, Richard M., of Foxhall, Rathowen, Ireland	1863 Fulton, William, Hatchetnize, Coldstream
1870 Fox, Wm., The Abbey, St Bees	1847 Fyfe, John, late of Dalmarnock, Glasgow
1881 Foyer, David, Knowhead, Campsie	1861 Fyfe, Robert, Clifton Villa, Balerno
1872 France, G. S., Bank House, Penicuik	1875 Fyfe, William (late Newton of Glamis, Glamis), Africa
1867 France, Robert, Craigbank House, Causewayhead, Stirling	1879 Fyshe, James, junior, Easter Balbeggie, Kirkcaldy
1874 Fraser, Alex. (Barrisdale), Commercial Bank, Provost of Inverness	1877 Fyshe, Peter, Wamphray, North Berwick
1857 Fraser, Alexander, Solicitor, 22 Union Street, Inverness	1868 Gairdner, Chas., Union Bank, Glasgow
1868 Fraser, Alex. (Neill & Co.), Canonmills Lodge, Edinburgh	1873 Galashan, Chas. C., Saddler, Alloa
1865 FRASER, Col. the Hon. A. E., Eilan Aigeas, Beaulieu	1872 Galbraith, John, Eskentagart, Lums
1820 Fraser, A. T. F., of Abertarff, Inverness	1880 Galbraith, John, Croy Cunningham, Kilmearn
1840 Fraser, Evan Baillie, Balloan Cottage, Inverness	1873 Galbraith, Thos. L., Town Clerk, Stirling
1869 Fraser, Fran. G., of Findrack, Torphins	1860+GALLOWAY, Right Hon. the Earl of, Galloway House, Galloway
1869 Fraser, Colonel Fred. Mackenzie, of Castle Fraser, Aberdeen	1874 Galloway, Alex., C.E., Tighmait, Aberfeldy
1873 Fraser, H. Newby, Portkill, Kilcraggan	1861 Galloway, David, Cairnie, Glencarse
1863 Fraser, Hugh, Balloch of Culloden, Inverness	1879 Galloway, Peter, Loan of Errol, Errol
1856 Fraser, Hugh, 29 Arundell Gardens, Kensington Park, London	1859 Gamgee, J., late 1 Great Winchester Street Buildings, London, E.C.
1874 Fraser, James, C.E., Inverness	1859 Garden, Arch., Grange Green, Forres
1874 Fraser, James, Mauld, Beaulieu	1874 Garden, Robert, North Ythan, Tarves
1877 Fraser, James, 6A Bristo Place, Edinburgh	1857 Garden, William, late Braeco Park, Fraserburgh
1840 Fraser, John, London	1868 Gardiner, John, Cockburn, Balerno
1865 Fraser, Capt. John, of Balmuir, Farraline, Stratherrick, Inverness	1864 Gardiner, P., Rottearns, Braeco, Perthshire
1879 Fraser, John M. (Macdonald & Fraser), Perth	1873 Gardiner, Patrick, Newbiggin, Auchterarder
	1861 Gardiner, R., of Rottearns, Chapelbank, Auchterarder
	1857 Gardner, George, Carrington Barns, Gorebridge

Admitted

- 1870 Gardner, John, 4 Abbotsford Place, Glasgow  
 1880 Gardner, Peter, Dunmore Pottery, Stirling  
 1855 Gardner, Robert, Gattonside, Melrose  
 1855 Gardner, Robert, Whitburn  
 1873 Gardner, Wm., Cashley, Buckleyvie  
 1877 Gardner, Wm., East Langton, Mid-Caldor  
 1867 Gardyne, Col. C. G., of Finhaven, Forfar  
 1825 Gartshore, John Murray, of Ravelston, Blackhall, Edinburgh  
 1864 Gartshore, John, Seedsman, Falkirk  
 1854 Gatherer, George, Solicitor, Elgin  
 1859 Gaunkroger, G., Southfield, Longniddry  
 1837 Geekie, Alex., of Baldowrie, Coupar-Angus  
 1873 Geekie, Peter, Barclay Hill, Perth  
 1861 Geekie, Peter M., Dollar  
 1871 Geekie, Robert, yr. of Baldowrie, Rosemount, Blairgowrie  
 1872 Geikie, Archibald, Professor of Geology, University of Edinburgh, Boroughfield House, Merchiston  
 1844 Geils, J. E., of Dumbuck  
 1877 Gell, H. Chandos Pole, Hopton Hall, Wirksworth  
 1875 Gemmell, Andrew, Lugton Ridge, Beith  
 1875 Gemmell, Gilbert C., Upper Whitehaugh, Muirkirk  
 1875 Gemmell, John, late Wool Well, Roboro, Devon  
 1873 Gerrard, John, Veterinary Infirmary, Market Deeping—*Free Life Member*  
 1871 Gibb, David, Kennyhill, Anstruther  
 1878 Gibb, John, Shields Mains, Biggar  
 1878 Gibb, Robert Shirra, Boon, Lander  
 1869 Gibbons, Thomas, 24 Cheswick Street, Carlisle  
 1849 Gibbs, Sir B. T. Brandreth, 47 Half Moon Street, Piccadilly, London  
 1871 Gibson, Charles, Pitlochry  
 1875 Gibson, Francis, Woolmet, Dalkeith  
 1876 Gibson, Henry John, Fornety, Foveran, Aberdeen  
 1871 Gibson, James, 34 Abbotsford Place, Glasgow  
 1876 Gibson, James, Glenstocking, Dalbeattie  
 1863 Gilson, James, 2 Chalmers Crescent, Edinburgh  
 1877 Gilson, James, Clifton Hall Mains, Ratho  
 1864 Gilson, J., Gungreen Hill, Ayrton  
 1879 Gilson, John George, 11 Mincing Lane, London  
 1860 Gibson, J. T. Tulloquhairn, Kirkbean, Dumfries  
 1875 Gilson, Jn., Langskail, Rousay, Orkney  
 1875 Gibson, Robert, Auchinaden, Strathblane  
 1843 Gibson, Thomas, Haymount, Kelso  
 1869 Gibson, Thomas, Bainfield, Fountainbridge, Edinburgh  
 1878 Gibson, Thomas, Sheriffyards, Clackmannan  
 1869 Gibsons, Lieut.-General, of Pentland, Red Cross Lodge, Leamington  
 1873 Giglioli, Italo, Florence—*Free Life Member*  
 1865 Gilchrist, Dugald, of Ospisdale, Dornoch  
 1877 Gilchrist, Andrew, Carvennoim, Anstruther

Admitted

- 1876 Gilchrist, Andrew, Manager's Office, Powers Court, Enniskerry, C. Wicklow  
 1875 Gilchrist, William, Knivocklaw, Loudoun  
 1842 Giles, James, Uplands, Guildford  
 1875 Gill, John, Blingery, Wick  
 1871 Gillespie, Alex., Kirkton Barns, Ferry-Port-on-Craig  
 1841 Gillespie, David, of Mountquhannie, Cupar Fife  
 1849 Gillespie, James, Craigie, Cramond  
 1860 Gillespie, James, Gateside, Douglas  
 1875 Gillespie, James, St Colmes, Ballinluig  
 1875 Gillespie, James John, Parkhall, Douglas  
 1847 Gillespie, John, W.S., 53 Northumberland Street, Edinburgh  
 1873 Gillespie, Rev. John, Mouswald Manse, Dumfries  
 1875 Gillespie, John, Land Steward, Minard, Inveraray  
 1877 Gillespie, Wm. C., Annanbank, Lockerbie  
 1877 Gillies, William, Writer Pollokshaws  
 1848 Gillon, Andw., of Wallhouse, Bathgate  
 1875 Gilmour, Alexander, Annfield House, Irvine  
 1849 Gilmour, Allan, of Eaglesham, Glasgow  
 1881 Gilmour, Hugh, Home Farm, Baltimore, Tigh-na-bruaich  
 1875 Gilmour, James, Orchardton, Cumnock  
 1872 Gilmour, John, younger of Landin, Montrave, Kennoway  
 1863 Gilmour, John, of Mount Vernon, Row  
 1857 Gilmour, Matthew, Town of Inchinnan, Paisley  
 1828 Gilmour, W. J. Little, of Craigmillar, New Club, Edinburgh  
 1853 Gilmour, W. M., Glasgow  
 1855 Girdwood, Robert, Tanfield, Edinburgh  
 1876 Gladstone, John Robert, yr. of Fasque, Laurencekirk  
 1884 GLADSTONE, Sir Thomas, of Fasque, Bart., Laurencekirk  
 1853 Gladstone, Thomas Stewart, of Capenoch, Thornhill  
 1854 GLASGOW, Right Hon. the Earl of, Crawford Priory, Cupar Fife  
 1847 Glasgow, Alexander, of Old Court, Cork  
 1874 Glasgow, R. Bruce Robertson, of Montgreenan, Kilwinning  
 1857 Glegg, John, Factor, Milliken House, Johnstone  
 1873 Glen, James, Rosebank, Luss  
 1872 Glen, James, Stronafyne, Arrochar  
 1847 Glen, John, late Merchant, Edinburgh  
 1860 Glen, Robert R., Banker, Linlithgow  
 1853 Glen, Thomas, Thornhill, Paisley  
 1869 Glendinning, Alex., Hatton Mains, Ratho  
 1849 Glendinning, George, Hatton Mains, Ratho  
 1878 Glendinning, Geo. P., Dalmeny Park, Edinburgh  
 1869 Glendinning, G. R., Hatton Mains, Ratho  
 1874 Glendinning, James P., Rawfarm, Mid-Caldor  
 1848 Glendinning, Peter, Dalmeny Park, Edinburgh  
 1878 Gloag, Wm. Ellis, of Kincairn, 6 Heriot Row, Edinburgh

## Admitted

- 1859 Glover, Andrew, Lanrick Castle, Doune  
 1873 Goddard, H. R., Belsay, Newcastle-on-Tyne—*Free Life Member*  
 1877 Goff, Dr Bruce, Woodlea, Bothwell  
 1873 Gold, Joseph, Murthly Farm, Perth  
 1865 Goldie, R. G. M., 3 Comely Green Place, Edinburgh  
 1874 Goodbrand, Jas. H., Culnaha, Nigg, Ross-shire  
 1875 Gordon, Adam Hay, of Mayen and Avochie, Huntly  
 1876 Gordon, Alex. Morrison, of Newton, Inch, Aberdeen  
 1875 Gordon, Arthur Newton Forbes, of Rayne, Pitcairnie  
 1866 Gordon, Chris., late Cannerie, Parton  
 1873 Gordon, Carlos Pedro, of Wardhouse, Inch, Aberdeenshire  
 1876 Gordon, Charles, of Hallmyre, Lamancha  
 1860 Gordon, David A., late of Culvennan, Castle-Douglas  
 1860 Gordon, George, Land Surveyor, Elgin  
 1873 Gordon, Captain Geo. G., Milntown of Kilravock, Nairn  
 1875 Gordon, Graham, Middlecote House, Ampth, Andover  
 1860 Gordon, Henry, Sheriff-Clerk, Moatbrae, Dumfries  
 1876 Gordon, Henry, of Manar, Inverurie  
 1868 Gordon, Henry Wolrige, of Hallhead, Esselmont, Eilon  
 1877 Gordon, James, Castle-Douglas  
 1874 Gordon, James A., of Arabella, Udale, Invergordon  
 1838 Gordon, John, of Aitkenhead, Cathcart  
 1870 Gordon, John (late Culraven, Kirkcudbright), America  
 1871 Gordon, John, of Craigmyle, Torphins  
 1875 Gordon, John, Balmuchy, Fearn  
 1831 Gordon, John Taylor, Bellevue Cottage, Ayr  
 1876 Gordon, Peter G., Nevie, Glenlivet, Ballindalloch  
 1846 Gordon, Robert Macartney, of Rattray, Ellenbank, Kirkcudbright  
 1870 Gordon, Robt. Wm., Only Grounds, Rugby  
 1863 Gordon, Thomas Dempster, late of Balmaghie, Castle-Douglas  
 1876 Gordon, William, Auchallater, Braemar  
 1876 Gordon, William, of Threave, Castle-Douglas  
 1879 GORDON, Sir William, of Earliston, Bart., Kirkcudbright  
 1876 Gossip, William, Park, New Machar  
 1866 Gough, Wm., Land Agent, Wykeham, York  
 1871 Goulding, W., North Wall, Dublin  
 1871 Gourlay, Robert Conning, Arbrack, Whitehorn  
 1860 Gowans, James, Rockville, Napier Road, Edinburgh  
 1868 Graeme, Robert, of Garvock, Perthshire  
 1873 Graham, Alexander, Blackwater, Kilmalcolm  
 1881 Graham, A. G. Maxtone, yr. of Cultoquhey, Perth  
 1879 Graham, Daniel Morgan, Auctioneer, Forfar

## Admitted

- 1869 Graham, George, Oakbank, Longtown  
 1855 Graham, H., Auckland, New Zealand  
 1827 Graham, James (late of Leithtown), Toronto, Canada  
 1848 Graham, James Maxtone, of Cultoquhey, Perth  
 1851 Graham, James, Parcelstown, Longtown  
 1863 Graham, James, late of Southbar, Paisley  
 1864 Graham, James, Myothill, Denny  
 1852 Graham, John, of Shaw, Lockerbie  
 1865 Graham, Paul, Brooke's Club, St James Street, London  
 1873 Graham, Robert G., Burnfoot-on-Falk, Longtown  
 1834 Graham, Col. William, of Mosskuowe, Ecclefechan  
 1871 Graham, William, Easter Caputh, Dunkeld  
 1876 Graham, Wm., Wheatlands, Crumond Bridge  
 1869 Graham, Wm. C., Elengall Villa, Blackheath, London  
 1833 Graham, W. Stirling, of Airth, Larbert  
 1873 Graham, James, Western Club, Glasgow  
 1861 Granger, John, Pitcur, Coupar-Angus  
 1854 Grant, Sir Archd., of Monymusk, Bart., Aberdeen  
 1872 Grant, A., Ardkinglas, Cairndow  
 1862 Grant, Charles, Hazelbrae, Glen Urquhart  
 1868 Grant, D. R. Lyall, of Kingsford, Aberdeen  
 1858 Grant, Francis William (Monymusk), 40 Pall Mall, London  
 1869 Grant, Captain Frederick G. Forsyth, of Ecclelsgrig, Montrose  
 1876 Grant, George, Glenfarclach, Ballindalloch  
 1874 Grant, George, Pollo, Invergordon  
 1859 GRANT, Sir George Macpherson, of Ballindalloch, Bart., Ballindalloch  
 1876 Grant, George Smith, Auchornachan, Glenlivet, Ballindalloch  
 1823 Grant, Rev. James, D.C.L., D.D., 15 Palmerston Place, Edinburgh—*Chaplain to the Society*  
 1865 GRANT, Lieut.-Col. the Hon. James Ogilvie, of Grant, Mayne House, Elgin  
 1871 Grant, John, Inverlaidman, Carr Bridge  
 1876 Grant, John, Banker, Muthlick  
 1865 Grant, John, 57 South Gildry Street, Elgin  
 1879 Grant, John, Mains of Advie, Advie, Craigellachie  
 1879 Grant, John Sinclair, Tullymet, Ballinluig  
 1853 Grant, Kenneth, Dingwall  
 1862 GRANT, Lieut.-Gen. Sir Patrick, G.C.B., Chelsea Hospital  
 1841 Grant, Robert, of Druminnor, Rhynie  
 1842 Grant, Robert, Bookseller, 107 Princes Street, Edinburgh  
 1878 Grant, Thomas B., "The Farm," Marlborough Street, Dublin  
 1846 Grant, Thos. Macpherson, of Craigo  
 1874 Grant, Major William, Drumblair, Glen Urquhart, Inverness  
 1862 Grant, William, Westar Alves, Forres

Admitted

- 1874 Grant, Colonel W. L., Borgia House, Farr, Thurso  
 1829 Grassick, John, 21 Ferryhill Place, Aberdeen  
 1878 Gray, Adam, jun., Ingleston of Borgue, Kirkcudbright  
 1859 Gray, Alex., Tanlawhill, Langholm  
 1873 Gray, Andrew, West Plean, Stirling  
 1880 Gray, C. W., of Carse Gray, Forfar  
 1879 Gray, E. A. Stuart, of Gray and Kinfauns, 19 Manor Place, Edinburgh  
 1880 Gray, James, Seedsman, Craigs, Stirling  
 1871 Gray, James, Kirkton of Collice, Balbeggie, Perth  
 1871 Gray, John, Merchant, Helensburgh  
 1876 Gray, John, 15 Exchange Square, Glasgow  
 1858 Gray, John, Engineer, Uddingston  
 1878 Gray, Robert Smith, Southfield, Duddingston  
 1854 Gray, Patrick, Middle Strath, Falkirk  
 1858 Gray, Thomas R., St Margaret's, Cheltenham  
 1849 Gray, Wm., Southfield, Duddingston, Edinburgh  
 1855 Gray, William, Brownrigg, North Berwick  
 1874 Green, Robert, Ruthrie, Aberlour, Craigellachie  
 1857 Green, William, Lynnburn, Aberlour, Craigellachie  
 1873 Greenlees, Alex., Summerhill, Campbelltown  
 1867 Greenshields, James, West Town, Lesmahagow  
 1876 Greenshields, Thomas A., Stonehill, Abington  
 1854 Gregory, Alex. Allan, Corn Merchant, Inverness  
 1833 Gregory, Arthur Thomas, late of Buchrumb, Duftown  
 1875 Gregory, John, Westoe, South Shields  
 1871 Greig, David (John Fowler & Co.), Leeds  
 1868 Greig, George (Harvieston, Stonehaven), 1 India Buildings, Edinburgh  
 1870 Greig, J. A. (Messrs Dickson & Son, Seedsman, Hanover Street), Edinburgh  
 1873 Greig, James Booth, Laurencekirk  
 1877 Greig, John, Fountain House Works, Fountainbridge, Edinburgh  
 1869 Greig, Peter M., 56 Inverleith Row, Edinburgh  
 1877 Greig, Robert M., Fountain House Works, Fountainbridge, Edinburgh  
 1852 Greig, Thomas, of Glencarse, Perth  
 1880 Greig, Thomas Crabb, Raphad, Stranraer  
 1861 Greig, T. Watson, Newton House, Glencarse, Perth  
 1854 Grey, Geo. A., Millfield Hill, Wooler  
 1831 Grier, W. F., 55 Bath Street, Glasgow  
 1880 Grierson, Sir A. D., of Lagg, Bart., Dumfries  
 1851 Grierson, J., Little Kirkland, Haugh of Urr, Dalbeattie  
 1860 Grierson, J., Lansdowne Villa, Kirkcudbright  
 1859 Grierson, Joseph, Breoch, Castle-Douglas

Admitted

- 1860 Grierson, Robert, West Mains, Mouswald, Dumfries  
 1859 Grierson, Wm., Tors, Castle-Douglas  
 1872 Grieve, Archd., Albanyrigg, Canonbie  
 1878 Grieve, Chas. John, Branzholm Park, Hawick  
 1847 Grieve, D., Blackberry Hill, Whitburn  
 1878 Grieve, Gilbert, Minnydow, Kirkpatrick-Durham, Dalbeattie  
 1878 Grieve, James, Borthwickbrae Burnfoot, Hawick  
 1879 Grieve, James, Langlees, Torryburn  
 1858 Grieve, John, Castles, Dalmally  
 1839 Grieve, John, Balmoral Hotel, Princes Street, Edinburgh  
 1877 Grieve, John, Merchant, North Berwick  
 1859 Grieve, Michael, Callander  
 1857 Grieve, Robert, Auch, Tyndrum  
 1857 Grieve, Robert, Edralaichdach, Trossachs, Callander  
 1861 Grieve, Walter, Cattleshield, Dunse  
 1854 Grieve, William, Skelfhill, Hawick  
 1858 Grigor, James D., Wester Alves, Forres  
 1847 Grigor, John, Nurseries, Forres  
 1871 Grimond, Alex. D., of Glencricht, Blairgowrie  
 1872 Guild, Andrew, Rhodors, Alva  
 1868 Guild, Jas., Balgone Barns, North Berwick  
 1874 Guild, James Lyon, Abbey, North Berwick  
 1868 Guild, James Wyllie, O.A., Glasgow  
 1881 Guild, Thomas, Herdhill, Kirriemuir  
 1877 Gulland, Wm. John, Monkton Hall, Musselburgh  
 1856 Gulston, Allan Jas., of Dirleton, Llangadock, Carmarthenshire  
 1858 Gunn, Alexander, Dale, Halkirk, Thurso  
 1856 Gunn, Alexander, Dornoch  
 1839 Gunn, James, Sibster, Wick  
 1849 Gunn, Marcus, Culgower, Loth, Sutherland  
 1875 Gunn, Wm., Strathpeffer, Dingwall  
 1854 Guthrie, David, Banker, Stranraer  
 1857 Guthrie, Robert, Crossburn, Troon  
 1874 Gwyer, Cecil F., Edinburgh  
 1834 Gwynne, Alban Thomas James, of Monachty, Cardigan  
 1857+HADDINGTON, Right Hon. the Earl of, Tynninghame, Prestonkirk  
 1857 Haddon, Andrew, Honeyburn, Hawick  
 1880 Haddon, Walter, Solicitor, Hawick  
 1880 Haddon, P.M., St Mary, Orton, Fochabers  
 1854 Hadwen, S., of Balblair, Bonar Bridge  
 1869 Hagart, James Valentine, W.S., 140 Princes Street, Edinburgh  
 1871 Haggart, Peter, Keltneyburn, Aberfeldy  
 1874 Haig, Archd. R., Quarryford, Gifford  
 1869 Haig, Hugh V., Cameron House, Windygates  
 1874 Haig, James Richard, of Blairhill, Stirling  
 1875 Haig, J. W., of Dollarfield, Dollar  
 1869 Haig, W. H. (Cameron House, Windygates), 42 Palmerston Place, Edinburgh  
 1857 Haig, William (late North Street, St Andrews), Australia  
 1861 Hain, David (late Drumrack, Craill), Canada  
 1871 Hain, Thomas, Balmullo, Leuchars, Fife

## Admitted

- 1870 Haining, J. J., Skipmyre, Lochmaben  
 1877 Hair, Ivie, Carnwath  
 1859 Haldane, Robert, Fernielee, Galashiels  
 1854 Halkett, Jas., Auchentender, Insh  
 1854 Halkett, Lieut.-Col. John Craigie, of Cramond, Edinburgh  
 1876 Hall, Alexander H., Campfield, Banchory  
 1873 Hall, Allan, Ardmaddy, Easdale, Oban  
 1855 Hall, Andrew, of Calrossie, Tain  
 1878 Hall, Sir Basil F., of Dunglass, Bart., Cockburnspath  
 1874 Hall, George Ross, Invergordon  
 1868 Hall, James, 33 Frederick Street, Aberdeen  
 1876 Hall, James M., of Tangy and Killean, Killean House, Tayinloan  
 1874 Hall, John, Tomich, Invergordon  
 1877 Hall, Robert, Felton, Dolphinton  
 1877 Hall, William, Linton Cottage, Panicuik  
 1877 Hall, Thomas Farmer (Thomas Farmer & Co.), Dunster House, Mark Lane, London, E.C.  
 1867 Hallan, J. H. B., L.R.C.S.E., Staff-Vet. Surgeon, H.M. Bombay Army  
 1868 Halley, George, New Mills, Culross  
 1870 Halley, John, Dornoch Mills, Crief  
 1865 Halliday, Thomas, Rosehall Foundry, Haddington  
 1877 Halliday, Thomas Scott, Administrator-General's Office, Georgetown, Demerara  
 1865+HAMILTON & BRANDON, His Grace the Duke of, K.T.  
 1868 Hamilton, Claude Hamilton, Preston Hall, Dalkeith  
 1861 Hamilton, Daniel, 66 Hutchison Street, Glasgow  
 1875 Hamilton, Gavin, of Auldtown, Lesniahgow  
 1869 Hamilton, George, Ardendee, Kirkcubright  
 1876 Hamilton, George, of Skene, Skene House, Skene, Aberdeen  
 1853 Hamilton, Hugh, of Pinmore, Girvan  
 1865 Hamilton, James, Wallace Bank, Kilmarnock  
 1869 Hamilton, J. B. B. Baillie, of Arnprior, Cambusmore, Callander  
 1869 Hamilton, James, Woolfords, Carnwath  
 1870 Hamilton, John, Conenish, Tyndrum  
 1839 Hamilton, Lieut.-Col. John, of Sundrum, Ayr  
 1872 Hamilton, John, Banker, Lesmahagow  
 1880 Hamilton, John Alex. (Hamilton and Crichton), 41 George Street, Edinburgh  
 1846 Hamilton, John Buchanan, of Leny, Callander  
 1857 Hamilton, John G. Carter, M.P., of Dalzell, Motherwell  
 1855 Hamilton J. B. (late Burnhouse, Carnwath), London  
 1870 HAMILTON, The Hon. R. B., Langton Dunse  
 1871 Hamilton, Robt., Denmarkfield, Redgorton  
 1873 Hamilton, Robert, 29 St James Square, Edinburgh  
 1877 Hamilton, Thomas, Poniell, Douglas, Lanarkshire  
 1878 Hamilton, Thomas, Brick and Tile Manufacturer, Carlisle

## Admitted

- 371 Hamilton, William, Denmarkfield, Redgorton  
 364 Hamilton, Wm., of Cairns, Mid-Calders  
 374 Hamilton, William Cameron, Baltasound, Unst  
 359 Hamilton, Wm. F., Callendar Park, Falkirk  
 380 Hamilton, Wm. Sloan, Springside, Kilmarnock  
 372 Handyside, J. B., Fenton, Drem  
 375 Handyside, Thomas, 10 Leonard Bank, Perth  
 343 Handyside, W., 11 Claremont Crescent, Edinburgh  
 372 Hannan, J. D., Tayport Estates Office, Dundee  
 358 Hannay, John, Gavenwood, Banff  
 376 Hannay, Robert, Bournemouth, Torquay  
 371 Hardie, Chas., Primrose, Dunfermline  
 370 Hardie, David, Priestthaug, Hawick  
 375 Hardie, Edmund W., Locher House, Bridge of Weir  
 1851 Hardie, George, Australia  
 1878 Hardie, John, jun., Mull of Galloway, Stranraer  
 1861 Hardie, Robert, Harriestfield, Kelso  
 1863 Hardie, W. H., Bo'Mains, Linlithgow  
 1878 Hare, Lieut.-Col., Philipston House, Winchburgh  
 1880 Harkness, Walter Irvine, Shaws, Ettrick, Selkirk  
 1873 Harley, D., Hillwood Cottage, Batho  
 1853 Harper, Frank, Torgorm, Dingwall  
 1876 Harper, Frank Vogan, Bridgend, Linlithgow  
 1880 Harper, John, Factor, Traquair, Innerleithen  
 1867 Harper, Joseph, Snawdon, Gifford  
 1871 Harper, William, Sheriffhall Mains, Dalkeith  
 1864 Harris, Richard H., Earnhill, Forres  
 1871 Harris, Wm., Innkeeper, Alyth  
 1867 Harris, Wm., Tirlinto, Aberfeldy  
 1864 Harrison, George, 17 Whitehouse Terrace, Edinburgh  
 1880 Harrison, George H., 3 Warrender Park Road, East  
 1846 Harrop, I. Worthington, New Zealand  
 1869 Hart, J. Christine, Borrostone, Kincauldine O'Neil  
 1873 Hart, William, Pothill, Auchterarder  
 1850 Harvey, Geo., Whittinghame Mains, Prestonkirk  
 1876 Harvey, George Thomson, Aberdeen Line Co., Aberdeen  
 1854 Harvey, J. H., Pitgerric, Foveran, Elton  
 1852 Harvie, Rev. W., of Brownlee, Carlisle  
 1860 Hathorn, John Fletcher, of Castlewigg, Whithorn  
 1875 Haughton, Wm. Hoghton, Factor, Craigowan, Kilmarnock  
 1875 Hay, Alexander, 16 Duke Street, Edinburgh  
 1864 Hay, Alex., Byres, Fochabers  
 1870 Hay, Alex., Easter Culmahudie, Perth  
 1874 Hay, Alex. Penrose, Riverdale, Inverness  
 1862 Hay, Col. A. S. Leith, of Rannes, C.B., Leith Hall, Kennethmont

# Highland and Agricultural Society, 1881.

## Admitted

- 1865 Hay, C., Ardlbeg, Islay, Greenock  
 1862 Hay, Colonel Drummond, of Seggieden, Perth  
 1841 Hay, Geo. W. (of Whiterigg), Sudbury  
 1802 Hay, Captain J. G. Baird, of Belton, Dunbar  
 1852 Hay, James, 28 Queen Street, Edinburgh  
 1858 Hay, Jas., jun., Little Ythsie, Farves  
 1878 Hay, James Tonner, of Whitmuir, Selkirk  
 1878 Hay, James S., Clydesdale Bank, Falkirk  
 1878 Hay, James Francis Dalrymple, yr. of Park Place, Auchendoon, Newton-Stewart  
 1848 HAY, Sir J. C. Dalrymple, of Park Place, Bart., M.P., Glenluce  
 1867 HAY, Sir Robert, of Haystoun, Bart., Kingsmeadows, Peebles  
 1869 Hay, Wm., 17 Hill Street, Edinburgh  
 1876 Hayman, John, Dumfries House Mains, Cummock  
 1872 Hazle, Alex., of Blackeraig, Drumburle House, Maybole  
 1876 Hector, Andrew Edward, Collyhill, Inverurie  
 1871 Heggie, Henry, Mains of Beath, Crossgates  
 1871 Heggie, Robert B., West End House, Kirkcaldy  
 1871 Heiton, Andrew, of Darnick Tower, Perth  
 1869 Henderson, Adam, Grange, Dumfriesline  
 1837 Henderson, Alex., Longniddry  
 1847 Henderson, Alex., of Stemster, Thurso  
 1873 Henderson, A. W., Airthrey Paper Mills, Bridge of Allan  
 1874 Henderson, A. W., of Bilbster, Wick  
 1847 Henderson, Charles J., Coltbridge Hall, Murrayfield, Edinburgh  
 1854 Henderson, David, of Abbotrule, Bonchester Bridge  
 1878 Henderson, G. D. Clayhills, Commander R.N., Invergowie, Dundee  
 1860 Henderson, George, Garroch, Dumfries  
 1863 Henderson, Jas., Mintokalm, Hawick  
 1860 Henderson, Jas., Kelloside, Sanguhar  
 1839 Henderson, J., W.S., Banker, Thurso  
 1860 Henderson, John, Byres, Haddington  
 1876 Henderson, John (Courtstown of Leslie, Inch), 46 Castle Street, Edinburgh  
 1859 Henderson, John, 2 Dean Bank Terrace, Edinburgh  
 1877 Henderson, Jn., Longniddry, East Lothian  
 1878 Henderson, John, East Elrington, Haydon Bridge—*Free Life Member*.  
 1874 Henderson, Richard, The Grange, Kirkcudbright—*Free Life Member*.  
 1858 Henderson, Robert, Whins Road, Alloa  
 1880 Henderson, Robert, East Gordon, Gordon, Berwickshire  
 1854 Henderson, Thos., 6 Saville Road, Edinburgh  
 1861 Henderson, W., Milltown, Coupar-Angus  
 1877 Henderson, Wm., of Redford, Linlithgow  
 1862 Hendrie, John, of Larbert, Stirlingshire  
 1866 Hendrie, John, Builder, Inverness  
 1874 Henry, John, S.S.O., 29 Rutland Square, Edinburgh

## Admitted

- 1863 Hepburn, J., Preston Mains, Prestonkirk  
 1876 Hepburn, James, Spittal, Keithhall, Inverurie  
 1877 Hepburn, John, Pitcairn, Lochgelly  
 1879 Hepburn, Jn., Seedsman, Dunbar  
 1837 HERBURN, Sir Thos. Buchan, of Smeaton, Bart., Prestonkirk  
 1881 Herbertson, Robert H., Fans, Earlston  
 1876 Herdman, Benjamin A., Falkland Wood, Falkland  
 1877 Herdman, George, Fordel, Dalkeith  
 1878+HERRIES, Right Hon. Lord, Everingham Park, York  
 1853 Herries, Alexander Young, of Spottes, 16 Heriot Row, Edinburgh  
 1877 Herron, W., Town-Clerk, Renfrew  
 1857 Hewat, Richard, Writer, Castle-Douglas  
 1882 Hewetson, J., Auchencrainzie, Thornhill  
 1870 Hewetson, Joseph, Balterson, Newton-Stewart  
 1870 Hiddleston, John, Braehead, Dalswinton, Dumfries  
 1863 Higgins, Robt., Ninewar, Prestonkirk  
 1861 Hill, Alex., of Stonywynd, Boarhills, St Andrews  
 1873 Hill, Arthur James (Theodore Jones, Hill, & Co.), Accountant, 36 Lansdowne Road, London W.—*Free Life Member*.  
 1877 Hill, David, Upper Magnus, St Andrews  
 1847 Hill, Jas. Lawson, W. S., 26 Heriot Row, Edinburgh  
 1861 Hill, James, Bradeston, Meigle  
 1850 Hill, John, Carlowie, Cramond Bridge  
 1868 Hill, John, Whitehill, Rosewell  
 1881 Hill, John, Langside, Kennoway  
 1851 Hill, Robt., Navidale, House, Helmsdale  
 1874 Hill, Robert Robertson, Navidale House, Helmsdale  
 1863 Hilson, George, jun., Solicitor, Jedburgh  
 1860 Hilton, Henry, of Fairgirth, Dalbeattie  
 1875 Hindmarsh, Chas., Land Agent, 17 Bridge Street, Workington  
 1869 Hislop, John, Goatfield, Haddington  
 1862 Hobkirk, Jas., Broadhaugh, Hawick  
 1880 Hodge, John, Lochill, Mauchline  
 1877 Hodgson, John W., Flatt, Kirkcumbarton, Carlisle  
 1860 Hog, Thos. A., of Newliston, Kirkcliston  
 1863 Hogarth, George, Warren, Salisbury  
 1842 Hogarth, George, Banker, Cupar Fife  
 1863 Hogg, Henry, Symington Mains, Stow  
 1876 Hogg, Robert, Victoria Place, Shawlands, Glasgow  
 1859 Hogg, Robert, Rosemay, Lealburn  
 1854 Hogg, Thomas, Hope Park, Hillhouse, Coldstream  
 1880 Hogg, Thomas, Lewnishope, Selkirk  
 1880 Hoggan, Andrew, Jun, Camphill, Glasgow  
 1873 Holliday, Jonathan, Waver Terrace, Abbey Town, Carlisle  
 1878 Holliday, Wm., Pelutho West House, Abbey Town, Carlisle  
 1878 Holliday, Wm., Plumland Mill, Aspatia, Carlisle  
 1875 Holm, John, Jaapston, Neilston  
 1880 HOLM, The Hon. Matthew, Awamoa, Otago

- Admitted  
 1879 Holmes, Wm., Fullarton Street, Irvine  
 1874 Holst, Christian, Chamberlain to His Majesty Oscar II., and Norwegian Court Paymaster—*Honorary Associate*  
 1843+Home, Right Hon. the Earl of, The Hirsell, Coldstream  
 1886 Home, David Milne, of Milnegraden, Coldstream  
 1874 Home, David Milne, of Wedderburn, M.P., 88 Queensgate Terrace, London  
 1819 Home, Francis, Bellsyde, Linlithgow  
 1881 Home, G. H. M. Binning, of Argaty, Doune  
 1858 Hood, Archibald, Rosewell, Lasswade  
 1878 Hood, David, Balgreddan, Kirkcudbright  
 1867 Hood, James (late Newmans, Preston-kirk), Australia  
 1880 Hood, James, Cove, Cockburnspath  
 1859 Hood, John, Townhead, Cockburnspath  
 1875 Hood, Robert, of Sunnyside, M.D., 5 Salisbury Road, Edinburgh  
 1854 Hood, T. Coldstream Mains, Coldstream  
 1877 Hood, William, The Cove, Cockburnspath  
 1878 Hope, Alex., Chapel on Leader, Earlstoun  
 1880 Hope, Alex., Cleveland Cottage, Middleton in Teesdale, Darlington  
 1869 Hope, Alex. P., Oxwell Mains, Dunbar  
 1832 Hope, Sir Archibald, of Pinkie, Bart., Musselburgh  
 1877 Hope, Hon. Charles, of Bridge Castle, Bathgate  
 1865 Hope, Henry W., of Luffness, Drem  
 1868 Hope, Admiral Sir James, of Carriden, G.C.B., Bo'ness  
 1847 Hope, James, Duddingston, Edinburgh  
 1848 Hope, Jas., of Belmont, W.S., 42 Charlotte Square, Edinburgh  
 1877 Hope, James Edward, Belmont, Murrayfield  
 1878 Hope, John David, New Club, Edinburgh  
 1878 Hope, John Wilson, 2 Darnaway Street, Edinburgh  
 1859 Hope, William P., Leith  
 1878 Hope, William James, Duddingston, Edinburgh  
 1871 Horn, John, of Thomanean, Milnathort  
 1864 Horncastle, Henry, Whitemoor, Ollerton, Newark  
 1881 Horne, Edward William, of Stirkoke, Caithness  
 1851 Horne, T. E. O., W.S., 19 Grosvenor Street, Edinburgh  
 1880 Horne, Thomas, jun., 19 Grosvenor Street, Edinburgh  
 1878 Hornsby, James (R. Hornsby & Sons), Spittalgate Ironworks, Grantham  
 1853 Hosack, William, Barcaldine, Ledaig  
 1877 Houldsworth, Arthur, Springfield House, Lasswade  
 1865 Houldsworth, Henry, jun., Glasgow  
 1868 Houldsworth, James, of Coltness, Wishaw  
 1865 Houldsworth, J. M., Carrick House, Ayr  
 1857 Houldsworth, Joseph Henry, Glasgow  
 1872 Houldsworth, Walter J., Coltness House, Wishaw  
 1857 Houldsworth, William, Glasgow  
 Houston, John, Overlaw, Kirkcudbright
- Admitted  
 1878 Houston, John, The Hill, Castle-Douglas  
 1875 Houstoun, George L., of Johnstone, Johnstone, Renfrewshire  
 1877 Houstoun, Michael Henry, of Beechhill, Haddington  
 1873 Houstoun, Robert A., of Glenkington, Haddington  
 1854 Houstoun, Wm., of Kintradwell, Galloway  
 1859 Howard, James, M.P. (J. & F. Howard), Bedford  
 1865 Howatson, Charles, of Glenbuck, Lanark  
 1875 Howatson, John L., Becks, Langholm  
 1876 Howatson, W. M. S., Carskeoch, Patna, Ayrshire  
 1865 Howden, John, late Seedsman, Inverness  
 1864 Howden, John, Overseer, Nether Braco, Perthshire  
 1854 Howe, Alexander, W.S., 17 Moray Place, Edinburgh  
 1863 Howie, H. Brown, North Hazelrigg, Bedford, Northumberland  
 1863 Howie, James, Haddon, Kelso  
 1857 Howie, John, Earlford, Kilmarnock  
 1879 Howie, William, Finnochhogg, Inverkip  
 1862 Hozier, W. W., of Newlands, Mauldslee Castle, Carlisle  
 1853 Hubbach, Joseph, Liverpool  
 1865 Hudsphith, Wm., Green Croft, Haultwhistle  
 1877 Hughs, Peter H., Cults, Whithorn  
 1838 Hughs, Thomas, of Airds  
 1872 Hughes, George P., of Middleton Hall, Wooler  
 1875 Hugonin, R., Kinmylies House, Inverness  
 1857 Huie, James, Durry, Campbeltown  
 1869 Hume, Archibald, of Auchendolly, Dalbeattie  
 1880 Hume, David, Barrelwell, Brechin  
 1871 Hume, George T., late Sunlawshill, Kelso  
 1869 Hume, John, Balmirner, Arbroath  
 1840 Hume, P. Hallyburton, late Lawfield, Cockburnspath  
 1879 Hunt, Arthur E. Brooke (B.A., Trin. Col., Cam.), Peers Court, Dursley, Gloucestershire—*Free Life Member*  
 1859 Hunt, James Alex., of Pittencrieff, Logie, Dunfermline  
 1855 Hunter, Alex., Nethershiel, Ratho  
 1876 Hunter, Capt. Alexander C., of Tillery and Auchries, Aberdeen  
 1867 Hunter, David, Gultreehill, Maybole  
 1860 Hunter, Evan Alan, W.S., 121 Princes Street, Edinburgh  
 1861 Hunter, Herb., of Burnhead, Lockerbie  
 1876 Hunter, James, of Autonshill, Coldstream  
 1857 Hunter, James, Coplawhill, Strathbungo, Glasgow  
 1852 Hunter, James, of Glenapp, Newmains House, Newmains  
 1879 Hunter, James, Timber Bush, Leith  
 1876 Hunter, John, Coufunderland, Leochel-Cushnie  
 1864 Hunter, John, Dipple, Fochabers  
 1875 Hunter, John, Nethershiel, Mid-Caldor  
 1877 Hunter, John, jun., Woodhall Mains, Juniper Green  
 1871 Hunter, Patrick, Argaith, Perth  
 1879 Hunter, Major Patrick, of Auchterarder

Admitted

- 1878 Hunter, Thomas, Maybole  
 1862 Hunter, Robt., 10 Ainslie Place, Edinburgh  
 1860 Hunter, William, Craighead, Abington  
 1870 Hunter, William, Crawfordton Lodge, Melniaive  
 1853 Hunter, William B., North Berwick  
 1857 Hunter, William, Machribeg, Campbeltown  
 1872 HUNTLY, Most Noble the Marquis of, Aboyne Castle, Aboyne  
 1859 Husband, Robert, Gellat, Dunfermline  
 1838 Hutchinson, Jas., Merchant, Glasgow  
 1857 Hutchison, James, Mouswald Farm, Dumfries  
 1880 Hutchison, Graham, of Balmaghie, Castle-Douglas  
 1872 Hutchison, James Thomas, 12 Douglas Crescent, Edinburgh  
 1879 Hutchison, John Wm., of Edinghame, Argynnam, Castle-Douglas  
 1871 Hutchison, Robt., Merchiston Avenue, Edinburgh  
 1850 Hutchison, Robt., Braehead, Kirkcaldy  
 1858 Hutchison, R., of Carlowie, 29 Chester Street, Edinburgh  
 1875 Hutchison, Thomas, Bellfield, Duddingston  
 1870 Hutchison, Thomas, Broomhill, Loanhead  
 1868 Hutton, Arthur, Comlongan Castle, Annan  
 1878 Hutton, James, Charter House, Maxwelltown, Dumfries  
 1859 Hyndman, Henry C., of Springside, 6 South Park Terrace, Hillhead, Glasgow  
 1870 Hyslop, And., Auchencroch, Dalbeattie  
 1880 Hyslop, Wm., Glenries, Sanquhar  
 1880 Imrie, James S., Somerset Villa, Perth  
 1873 Imrie, John L., Blackhill, Maryhill, Glasgow  
 1855 Inch, John, West Mains, Liberton  
 1878 Inch, John, Howburn, Walston, Biggar  
 1877 Inch, Robert, 1 Victoria Street, Edinburgh  
 1870 Inch, Thomas, Gilkiesclench, Abington  
 1869 Inglis, Alex. Wood, yr. of Glencorse, 30 Abercromby Place, Edinburgh  
 1864 Inglis, George, Dron, Cupar Fife  
 1879 Inglis, George, of Newmore, Invergordon  
 1847 Inglis, Harry Maxwell, of Loganbank, 31 Abercromby Place, Edinburgh  
 1856 Inglis, Lieut.-Col. Hugh, of Kingsmills, Inverness  
 1852 INGLIS, Right Hon. John, of Glencorse, Lord Justice-General, 30 Abercromby Place, Edinburgh  
 1860 Inglis, John, Junction Steam Mills, Leith  
 1857 Inglis, John, of Redhall  
 1864 Inglis, John, Kepdarroch, Gargunnoch  
 1865 Inglis, Peter, East Pitton, Ferry Road, Edinburgh  
 1877 Inglis, Peter, Holyrood Palace, Edinburgh  
 1877 Inglis, Robert, Lovestone House, Girvan  
 1867 Inkson, Patrick, Kinnermony, Craigellachie

Admitted

- 1876 Inkson, Thomas F., Kinnermony, Craigellachie  
 1840 Innes, Alex., of Raemoir, Banchory  
 1842 Innes, Alexander Mitchell, of Ayton  
 1874 Innes, Charles, Solicitor, Inverness  
 1847 Innes, George Mitchell, of Bangour, 32 Buckingham Terrace, Edinburgh  
 1847 Innes, John B., W.S., 11 Moray Place, Edinburgh  
 1846 Innes, Col. Thomas, of Learney, Torphins  
 1842 Innes, Thos. S. Mitchell, of Phantassie, Prestonkirk  
 1862 Innes, T. G. Rose, of Netherdale, Turriff  
 1876 Innes, William, Hope Farm, Auchmull, Aberdeen  
 1879 Ireland, David S., Brewer, St Andrews  
 1858 Ironside, John, Brindy, Keig, Whitehouse, Aberdeen  
 1859 Ironside, William, Clofrickford, Ellon  
 1845 Irvine, Alex. Forbes, of Drum, Sheriff of Argyll, 25 Castle Terrace, Edinburgh  
 1873 Irvine, George Forbes, Nigg, Ross-shire  
 1869 Irvine, Walter, Grangemuir, Pittenweem  
 1843 Irvine, Wm. Stewart, M.D., Craigatin, Pitlochry  
 1870 Irvine, Ben., Barudennoch, Auldgrith, Dumfries  
 1870 Irving, Christopher, Blackearn, Castle-Douglas  
 1870 Irving, John, Borland, Dunscore, Dumfries  
 1838 Irving, John, London  
 1869 Irving, J. Bell, of Whitehill, Lockerbie  
 1872 Irving, Samuel, Carco, Kirkconnel, Sanquhar  
 1873 Irving, Thos., Curriestanes, Dumfries  
 1872 Jack, Gavin, North Gyle, Corstorphine  
 1864 Jack, John S., Cambusdrennie, Stirling  
 1863 Jack, M., Feggy's Mill, Crumond Bridge  
 1860 Jack, Samuel, Mersington, Coldstream  
 1855 Jack, Robt., Banker, Motherwell  
 1869 Jack, Thos., Herniston  
 1870 Jackson, John, Bush, Ewes, Langholm  
 1876 Jaffray, James Belmont, Unst  
 1852 Jameson, Melville, Solicitor, Perth  
 1880 Jamieson, Alex., 31 Barossa Place, Perth  
 1858 Jamieson, David, Auchmithie Mains, Arbroath  
 1876 Jamieson, George, 34 Nether Kirkgate, Aberdeen  
 1860 Jamieson, George Auldjo, C.A., 58 Melville Street, Edinburgh  
 1874 Jamieson, James Auldjo, W.S., 14 Buckingham Terrace, Edinburgh  
 1880 Jamieson, John, 31 Barossa Place, Perth  
 1865 Jamieson, Michael J., of Arngomery, Kippen, Stirling  
 1874 Jamieson, Robt. J., S.S.C., Borrowstounness  
 1871 Jamieson, Thos., High Curghie, Drumore, Stranraer  
 1875 Jamieson, Wm., of Shandon, Helensburgh  
 1876 Jamieson, William T., Solicitor, Anstruther  
 1853 Jamieson, Wm. H., Mayshade, Loanhead  
 1850 JARDINE, Sir Alexander, of Applegirth, Bart., Jardine Hall, Lockerbie



## Admitted

- 1846 Jardine, Andrew, of Lanrick, Doune  
 1873 Jardine, Andrew, Ballenanooh, Helensburgh  
 1878 Jardine, Arthur Murray, of Granton, Moffat  
 1846 Jardine, Jas., of Larriston, Dryfeholm, Lockerbie  
 1854 Jardine, John, of Thorlieshope, Arkleton, Langholm  
 1863 Jardine, Robt., of Castlemilk, M.P., Lockerbie  
 1877 Jardine, Wm., Bogside, Fintry, Glasgow  
 1870 Jefferson, Robt., Preston Hows, Whitehaven  
 1857 Jeffray, John, Cardowan House, Millerston, Glasgow  
 1876 Jeffrey, Arthur, Banks, Fyvie  
 1869 Jeffrey, David, 14 Randolph Crescent, Edinburgh  
 1859 Jeffrey, John, of Balsansney, Largo House, Largo  
 1880 Jenkinson, A.D., 10 Princes Street, Edinburgh  
 1855 Jobson, William, Ashfield Villa, Heaton, Newcastle  
 1872 Johnson, W. H., Ramrig, Ladykirk, Berwickshire  
 1836 Johnston, Alex., W.S., Foveran House, Newburgh, Aberdeen  
 1852 Johnston, Alex., Hailes, Slatford  
 1877 Johnston, Alexander, North Mains, Ormiston  
 1872 Johnston, Donald, Kilbride, Easdale, Oban  
 1857 Johnston, G., M.D., Fincaigs, Newport  
 1872 Johnston, Geo., Aquhorthies, Inverurie  
 1860 Johnston, James, Banker, Dumfries  
 1857 Johnston, James, Huntingdon, Lauder  
 1876 Johnston, James, Pather Farm, Wishaw  
 1871 Johnston, James, Cattle-dealer, Perth  
 1878 Johnston, Jas., Lochburnie, Maryhill  
 1879 Johnston, James, jun., Secretary, Orkney Agricultural Society, Orphir, Orkney  
 1877 Johnston, James, Gairloch, Dumfries  
 1856 Johnston, John, Banker, Bathgate  
 1869 Johnston, John, Kingledoors, Biggar  
 1853 Johnston, J. S., Craillinghall, Jedburgh  
 1877 Johnston, Laurence (of Sands, Perth), 11 Castle Street, Edinburgh  
 1839 Johnston, Robt., Kinnundy, Skene, Aberdeen  
 1860 Johnston, Lieut.-Gen., of Carnsalloch Castle-Douglas  
 1871 Johnston, Stewart J., Cattle-dealer, Perth  
 1859 Johnston, Thos., Lochhouse, Moffat  
 1848 Johnston, Sir William, of Kirkhill, Gorebridge  
 1852 Johnston, Wm., Writer, Bathgate  
 1876 Johnston, William (late Mill of Haulkerton, Laurencekirk), South Africa  
 1857 Johnston, William, Ranachan, Campbelltown  
 1878 Johnston, Wm., of Cowhill, Dumfries  
 1850 Johnstone, Christopher, Glengyle Terrace, Edinburgh  
 1828 Johnstone, James, of Alva, Stirling  
 1873 Johnstone, James, Hunterheck, Moffat

## Admitted

- 1876 Johnstone, John, Drumwhindle Mains, Ellon  
 1878 Johnstone, John, of Halleathis, Lockerbie  
 1875 Johnstone, John, Auchearnie, Laurencekirk  
 1859 Johnstone, John, A., Archbank, Moffat  
 1870 Johnstone, John James Hope, of Annandale, Rachilla, Lockerbie  
 1866 Johnstone, Miss Hope, of Annandale, Marchbank Wood, Moffat  
 1831 Johnstone, Michael, Archbank, Moffat  
 1859 Johnstone, Robert, Polmoollie, Moffat  
 1859 Johnstone, Walter, Alton, Moffat  
 1874 Johnstone, W. M., National Bank of Scotland, Cupar Fife  
 1829 Jolly, David Leitch, Banker, Perth  
 1862 Jones, Charles Digby, late Kilmannig, Whitehouse, Kintyre  
 1865 Joss, Alexander, Cruchie, Huntly  
 1865 Joss, John, Budgate, Cawdor, Nairn  
 1873 Jukes, R. F., Cotwall, Wellington, Salop  
 —Free Life Member  
 1875 Kay, Charles, Mill Farm, Gargunnock  
 1871 Kay, Duncan James, of Drumquark, Dumfries  
 1864 Kay, James, Hillhead, Gargunnock  
 1863 Kay, John, Softlaw, Kelso  
 1872 Kay, John, jun., Softlaw, Kelso  
 1867 Kay, Robt., Tuns, Minard, Inverary  
 1871 Kay, Robt., Linton Bankhead, Kelso  
 1863 Kay, Wm., Broomieknowe, Lasswade  
 1863, Kay, Wm., Inch Farm, Kincairdine-on-Forth  
 1879 Keay, Robert, Assistant Town-Clerk, Perth  
 1844 Keir, Andrew T., Clunas, Nairn  
 1864 Keir, Duncan, Buchlyvie, Stirling  
 1837 Keir, Patrick Small, of Kindrogan, Pithlochry  
 1857 Keir, Simon, Conservative Club, London  
 1859 Keir, William, of Whithaugh, Newenstone  
 1876 Keith, Alexander, Chapelton, Ellon  
 1876 Keith, Jas., Newton of Kinnundy, Mintlaw  
 1865 Keith, Peter, Factor, Barrogill Castle, Wick  
 1872 Kellie, John B., Ladywell, Dunse  
 1874 Kelman, Wm., Balnagore, Fearn  
 1876 Kemp, Chas., Metherelmy, Dufftown  
 1852 Kemp, John, Agricultural Implement Maker, Stirling  
 1879 Kennedy, Captain A. W. M. Clark, of Knockgray, Guards Club, Pall Mall, London S.W.  
 1863 Kennedy, David, Castlehill, Dumfries  
 1865 Kennedy, Henry H., Rosbie Castle, Montrose  
 1859 Kennedy, Jas., of Sundaywell, Brandleys, Sanquhar  
 1874 Kennedy, John, Forester, Balmacran, Glen Urquhart  
 1871 Kennedy, John, Royal George Hotel, Perth  
 1878 Kennedy, John B., Stenhouse, Thornhill  
 1878 Kennedy, John Gillison, Newlands, Dumfries

Admitted

- 1846 Kennedy, John Lawson, of Knocknalling, Dalry, Galloway  
 1878 Kennedy, John Murray, yr. of Knocknalling, Dalry, Galloway  
 1872 Kennedy, Thos., Coachbuilder, Kelso  
 1876 Kennedy, William, 89 Marine Parade, Brighton—*Once Life Member*  
 1842 Kennedy, William, Commission Agent, Glasgow  
 1870 Kennedy, Wm., Kirkland, Sanquhar  
 1874 Kennedy, Wm., Dalnakerrian, Thornhill  
 1860 Kennoway, Robt., Burnhead, Lasswade  
 1863 Ker, E. Martin (late of Gatheshaw, Morebattle, Kelso), London  
 1854 Ker, Robt., of Douglaston, Milngavie  
 1878 Ker, T. Ripley, yr. of Douglaston, Milngavie  
 1864 Kerr, Abraham, Castlehill, Durisdeer, Thornhill  
 1878 Kerr, Arch., Upper Dormont, Lockerbie  
 1869 Kerr, James, Lochend, Kilbirnie  
 1880 Kerr, Jas. B., Commercial Bank, Kelso  
 1859 Kerr, John, Broomhouse, Corstorphine  
 1875 Kerr, John, Blountfield, Dumfries  
 1879 Kerr, John, Rossie Ochil, Bridge of Earn  
 1870 Kerr, Jos., Flats of Cargen, Dumfries  
 1857 Kerr, Robert, of Chapeldonan, 9 Great Stuart, Edinburgh  
 1877 Kerr, Robert, Factor, Ballikierain, Kilmearn  
 1860 Kerr, Thomas, Whitehill, Sanquhar  
 1845 Kerr, Wm. Williamon, late Oriel College, Oxford  
 1875 Kerr, William, Newhouse, Dalry, Ayrshire  
 1878 Kerr, Wm., Mid-Dargavel, Dumfries  
 1833 Kerr, W. S., of Chatto, Sunlaw, Kelso  
 1865 Kidd, Alexander F., East High Street, Airdrie  
 1874 Kidd, Hugh, V.S., 63 Wide Bargate, Boston, Lincolnshire  
 1869 Kidd, Walter, Balleny, Currie  
 1850 Kidston, Jn. P., Nym Park, Barnet, Herts  
 1875 Kidston, Richard, 81 Great Clyde Street, Glasgow  
 1864 Kier, Thomas, Newlands, Falkirk  
 1876 Kilgour, Robert, junior, Arillin, Elton  
 1862 Kilpatrick, P., Standcliffe, Matlock, Bath  
 1868 King, Charles M., Antermony House, Milton of Campsie  
 1864 King, David, Dunedin, New Zealand  
 1873 King, Duncan, 33 Forth Street, Stirling  
 1857 King, James, of Lovernholm, 12 Claremont Terrace, Glasgow  
 1872 King, James, West Mills, Colinton  
 1860 King, Jas. F., 5 Richmond Street, Glasgow  
 1871 King, J. Falconer, Analytical Chemist, Chambers Street, Edinburgh  
 1869 King, Robert, Lovernholm, Hurler  
 1878 King, William, jun., Earne, Doune  
 1839 King, William, Manufacturer, Glasgow  
 1868 King, Lieut.-Colonel Wm. Ross, of Tertowie, Kinellar, Aberdeen  
 1859 Kininmonth, Peter, Milton, Lenchairs  
 1859 KINLOCH, Sir Alexander, of Gilmerton, Bart., Drem  
 1825 KINLOCH, Sir George, of Kinloch, Bart., 32 Drummond Place, Edinburgh

Admitted

- 1877 Kinloch, John George Smith, yr. of Kinloch, 32 Drummond Place, Edinburgh  
 1829 Kinloch, Col. John Grant, of Kilrie, Logie, Kirriemuir  
 1862 KINNAIRD, Right Hon. Lord (Rossie Priory, Inchture), 1 Pall Mall East, London  
 1879 KINNAIRD, The Hon. The Master of, Rossie Priory, Inchture  
 1873 Kinnear, Arthur W., Stonehaven  
 1876 Kinnear, C. G. H., of Drum, 12 Grosvenor Crescent, Edinburgh  
 1853 KINNOULL, Right Hon. the Earl of, Dupplin Castle, Perth  
 1873 Kinross, Andrew, Hungryhill, Dunblane  
 1876 Kinross, James, Coldstream, Laurencekirk  
 1864 Kinross, J., Gaunochan, Braco, Perthshire  
 1871 Kinross, Thomas, Loig, Braco, Perthshire  
 1876 KIRKPATRICK, Right Hon. the Earl of, Keith Hall, Inverurie  
 1875 Kippen, Durham, of Busby, Glasgow  
 1848 Kirk, John, W.S., 12 Clarendon Crescent, Edinburgh  
 1861 Kirk, James, Kaimkuow, Muckhart  
 1874 Kirkland, Major-General John Agmondisham Vesey, of Wester Fortel, Milnathort  
 1875 Kirkness, John, Quoyosty, Ransay, Orkney  
 1860 Kirkpatrick, A., of Allanshaw, Hamilton  
 1875 Kirkpatrick, David, Louns, Torthorwald  
 1876 Kirkpatrick, James, Rethills, Torthorwald, Dumfries  
 1879 Kirkpatrick, James, Auctioneer, Annan  
 1860 Kirkpatrick, Samuel, West Roucan, Dumfries  
 1830 Kirkwood, Alexander, Medallist to the Society, 9 St James Square, Edinburgh  
 1871 Kirkwood, Allan, Killermont, Maryhill, Glasgow  
 1878 Kirwan, Lionel Maitland, Bellrig, Kelton Hill, Castle-Douglas  
 1879 Knight, Robert, jun., V.S., Woodhead Street, Dumfries  
 1867 Knight, Wm. Gray, of Jordanstone, Meigle  
 1858 Knowles, Thomas, Cheln, Stonehaven  
 1871 Knox, George, of Nether Malletslough, Mearns  
 1874 Knox, Robert, Woodside, Cambus, Alloa  
 1870 Kyd, George (Hay & Kyd), Perth  
 1860 Kynoch, George, jun., Isla Bank Mills, Keith  
 1872 Kynoch, Patrick, M.D., Greenlaw, Berwickshire  
 1878 Laidlaw, Robert, Rodono, Selkirk  
 1863 Laidlaw, J. W., of Seuchiffa, North Berwick  
 1877 Laing, Alexander, S.S.C., Glenord, Spylaw Road, Edinburgh  
 1863 Laing, George, Wark, Coldstream  
 1856 Laing, John, Newburgh, Fife  
 1855 Laing, Thomas, 17 Palmerston Road, Edinburgh

Admitted	Admitted
1880 Laing, Thomas (Little & Ballantine) Carlisle	1868 Lawson, C., Orilhead, Cluny, Aberdeen
1880 Laing, Walter, Manorhill, Kelso	1868 Lawson, Geo. Stoddart, Brighton
1874 Laing, William, Skail, Thurso	1859 Lawson, Henry Graham, Shoreham Lodge, Shoreham, Sussex
1868 Laird, Geo. W., of Denfield, Arbroath	1876 Lawson, James, Westerton, Huntly
1842 LAMINGTON, Right Hon. Lord, Lamington, Lanarkshire	1867 Lawson, Thomas, of Carriston, Markinch
1871 Lamont, Charles, of East Bank, Kinross	1879 Lawson, Thomas, Sandford, Kirriemuir
1850 Lamont, James, of Knockdow, Greenock	1853 Lawson, Wm., Easterfield, Turrit
1866 Lamont, Jn., Johns Cottage, Henderson Row, Edinburgh	1868 Learmonth, Lieut.-Col. Alex., of Dean, 73 Eaton Place, London
1864 L'Amy, John Ramsay, of Dunkenny, 105 Cromwell Road, London, S.W.	1878 Learmonth, Donald H., Househay, Stronsay
1879 Landale, Andrew, Woodmill, Auchtermuchty	1880 Learmonth, George Gray, North Bank, Bo'ness
1877 Landale, James, Woodmill, Auchtermuchty	1869 Learmonth, Thomas Livingstone, of Park Hall, Polmont
1878 Landale, James, Cockburnhill, Balerno	1881 Leask, William, Skilmaffly, Ellon
1874 Landale, John, of Woodbank, Banker, Dunfermline	1876 Leddigham, Alexander, Drumblair, Forgue, Huntly
1855 Landale, Thomas, 4 Mayfield Terrace, Edinburgh	1878 Lee, Alex. Henderson, of Blairhoyle, Port of Monteith
1867 Lang, Alex., Borthrickfield, Bridge of Weir	1863 Lee, John, Dollar Bank, Dollar
1875 Lang, Alex., Garneyland, Paisley	1877 Lee, The Hon. Lord, 26 Charlotte Square, Edinburgh
1849 Lang, Hugh M., of Broadmeadows, Selkirk	1855 Lees, John, late Marvingston, Haddington
1864 Lang, John, Bield, Gargunock	1863 Lees, Richard, Drinkstone, Hawick
1878 Lang, Robert J., Broadmeadows, Selkirk	1878 Leggett, Alex., Killyleoch, Dunscore, Dumfries
1854 Lang, William, Glengorm, Tobermory	1864 Leishman, James, of Broomrig, Dollar
1854 Langlands, James C., Bewick, Alnwick	1864 Leishman, T., 25 Park Terrace, Stirling
1857 Latham, Patrick R., The Kames, Lanrick Castle, Stirling	1858 Leitch, Arch. K., Inchestally, Forres
1864 Latta, Mat. Rodger, Carmyle, Tollcross, Glasgow	1877 Leitch, Simon, Factor, Tankerness Hall, Kirkwall
1873 Latta, William, Dermalloch, Cumnock	1841 Leith, Alex., of Freefield, Glenkindie, Inverkindie
1868 Lauder, Alex., Goshen, Musselburgh	1869 Leith, Major Thomas, Westhall, Oyne
1859 Lauder, Dewar, St Nicholas, St Andrews	1875 Leithhead, James, Turnidykes, Ford, Dalkeith
1873 Lauder, William, Locherlour, Crieff	1857 Lennie, John, Long Newton, Gifford
1880 LAUDERDALE, The Right Hon. the Earl of, Thirlestane Castle, Lauder	1878 LENNOX, The Hon. C. S. B. Ilanbury-Kincaid, Lennox Castle, Lennoxtown
1877 Laurence, P., 57 Hanover Street, Edinburgh	1878 Lennox, David, Merchant, Dumfries
1873 Laurie, John W., Mitchelston, Stow	1873 Lennox, James, Doune, Clondouglas, Luss
1848 Laurie, William Kennedy, of Woodhall, Castle-Douglas	1865 Leny, W. Macalpine, of Dalswinton, Dumfries
1868 Law, James, East Mains, Broxburn	1876 Leslie, A. F., Braen, Keith
1876 Law, John, New Keig, Whitehouse, Aberdeen	1840 Leslie, G. A. Young, of Kininvie, Bedford
1868 Lawes, J. B., Rothamstead, St Albans	1862 LESLIE, Hon. George Waldegrave, Leslie House, Leslie
1874 Lawrence, James, Forres Mills, Forres	1857 Leslie, James, Thorn, Blairgowrie
1876 Lawrence, W. J., Gowanhill, Cortes, Lunmay	1873 Leslie, Robert G., of Butterglion, Dunkeld
1872 Lawrie, Alex., Hardens, Dunse	1879 Leslie, Thomas W., Welton, Blairgowrie
1873 Lawrie, Jas. D., of Monkrigg, Haddington	1863 Lesslie, James, Boghall, Linlithgow
1873 Lawrie, John, Kirklandhill, Leven	1879 Letham, John, East Mains, Stonehouse
1872 Lawrie, Thos., Esperston, Gorebridge	1864 Lidderdale, Wm. H., Writer, Castle-Douglas
1872 Lawrie, Thomas, Seed Merchant, Newton St Boswells	1858 Ligertwood, John, Sheriff-Clerk, County Buildings, Aberdeen
1875 Lawrie, Wm., Architect, Inverness	1878 Lightbody, William, Auctioneer, Dalbeattie
1863 Lawson, Alex., of Burnturk, Kettle	1875 Lightfoot, Henry Le Blanc, Fonthill Abbey, Salisbury
1843 Lawson, Alexander, Merchant, Dundee	1877 Lindesay, William Francis, Balmungo, St Andrews
1864 Lawson, Alexander, Brae Lossie, Elgin	
1846 Lawson, Chas., 84 George Square, Edinburgh	
1871 Lawson, Charles, Deebank, Cults, Aberdeen	

Admitted

- 1878 Lindsay, Hugh, Meadowflat, Thankerton  
 1878 Lindsay, James, Holehouse, Penpont  
 1873 Lindsay, Jas., Whitecastles, Lockerbhie  
 1847 Lindsay, James, New Zealand  
 1865 Lindsay, John, Thornhill, Stewarton  
 1878 Lindsay, John V., Whitehope, Selkirk  
 1862 Lindsay, Robert, Lilliehill Fireclay Works, Dunfermline  
 1857 Lindsay, Thomas, Flemington, Lamanha  
 1878 Lindsay, Thomas, Townend, Craigie, Kilmarnock  
 1869 Lindsay, Thos. S., 10 Chalmers Crescent, Edinburgh  
 1854 Lindsay, William, 7 Hermitage Hill, Leith  
 1875 Linn, William, 2 Park Terrace, Newcastle-on-Tyne  
 1873 Linton, Simon, Glenrath, Peebles  
 1878 Linton, William Thomson, Mount Benger, Selkirk  
 1863 Lithgow, E., Bodaluel, Greenlaw, Dunse  
 1869 Little, James, Fould, Longtown  
 1878 Little, James Clurell, Caulfield, Langholm  
 1859 Little, John, Meikleholmside, Moffat  
 1870 Little, Wm., Burnfoot, Langholm  
 1878 Little, William, High Bogue, Twynholm, Castle-Douglas  
 1870 Littlejohn, William, Whitemyers, Old Skene Road, Aberdeen  
 1879 Livingston, John, Brae of Cluny, Ballinluig  
 1863 Livingston, Thos. S. Fenton, of West Quarter, Polmont  
 1875 Lloyd, Thomas, of Minard Castle, Inveraray  
 1878 Lockhart, James, Mains of Airies, Stranraer  
 1866 Lockhart, Robert, jun., 10 Polwarth Terrace, Edinburgh  
 1872 LOCKHART, Sir Simon M., of Lee and Carnwath, Bart., Lanark  
 1870 Lockhart, W. Elliott of Borthwickbrae, Branksholme, Hawick  
 1859 Lockie, William, West Morriston, Earlston  
 1879 Loder, Robert, M.P., Whittlebury, Towcester  
 1831 Logan, Alexander, London  
 1878 Logan, David, Wragmire House, Carlisle  
 1876 Logan, John Walker, The Avenue, Berwick-on-Tweed  
 1872 Loney, Peter, Marchmont, Dunse  
 1858 Longmore, William, Banker, Keith  
 1881 Lonsdale, Claud, Rose Hill, Carlisle  
 1865 Lorimer, J., Achrossan, Tigh-na-brunich  
 1843 Lorimer, T. W., Mountrule, Douglas, Isle of Man  
 1869 Lorimer, William, Rigg, Sanquhar  
 1869\* LORNE, Most Noble the Marquis of, K.T., Canada  
 1869\* LOTHIAN, Most Noble the Marquis of, K.T., Newbattle Abbey, Dalkeith  
 1874 Lothian, Maurice John, Woodcot Park, Blackshields  
 1853\* LOVAT, Right Hon. Lord, Beaufort Castle, Beaulieu

Admitted

- 1875 Love, Alexander, Margaret's Mill, Kilmalcolm  
 1874 Love, James, late 1 Dellingburn Street, Greenock  
 1857 Lovie, Alex., Nether Boydallie, Fraserburgh  
 1843 Low, James, Laws, Whitsome  
 1878 Low, Peter, V.S., Perth  
 1861 Lowe, Robert, General Agent, Perth  
 1850 Lowndes, James, of Arthurlee, Barrhead  
 1871 Lowson, William, of Balthayock, Perth  
 1861 Lumsden, David, Pitcairnfield, Perth  
 1850 Lumsden, G., Leslie Lodge, Inverurie  
 1857 Lumsden, George, 30 Drumsheugh Gardens, Edinburgh  
 1877 LUMSDEN, General Sir Harry B., Belhelvie Lodge, Aberdeen  
 1869 Lumsden, Henry, of Pitcairle, Pitcairle  
 1877 Lumsden, Hugh Gordon, of Auchindoir, Aberdeen  
 1875 Lumsden, James, of Arden, Alexandria, N.B.  
 1876 Lumsden, William Harry, of Balmedie, Belhelvie  
 1870 Lusk, And., Howwell, Kirkcudbright  
 1877 Lusk, Peter, Craigcastle, Stranraer  
 1861 Lysal, Robert, Beattie, Brece  
 1872 Lysal, William, Fogorrig, Dunse  
 1850 Lyall, Chas. Old Montrose, Montrose  
 1854 Lyall, David, of Gallery, Montrose  
 1850 Lyall, Robert, Kellybank, Dollar  
 1879 Lyell, David, S.S.C., 39 Castle Street, Edinburgh  
 1861 Lyell, John, Banker, Newburgh  
 1859 Lyon, Jas., Burnhaugh, Stonehaven  
 1870 Lyon, Thomas A., Whitecroft, Lockerbhie  
 1871 Lyon, William, 16 Chronicle Lane, Aberdeen  
 1870 M'Adam, Jas. Nicol, High Trees, Marlborough, Wilts  
 1857 Macadam, John, Blairr, Drymen  
 1859 Macadam, Dr Stevenson, F.R.S.E., Surgeons' Hall, Edinburgh  
 1840 Macalister, A., of Loup and Torrisdale  
 1842 Macalister, Keith, of Glenbarr, Greenock  
 1855 M'Alister, Robert, Mid Aseng, Rathesay  
 1872 Macallum, Donald, Balligowan, Olney  
 1873 M'Alpine, James, Tilo Manufacturer, Springfield, Stirling  
 1854 Macandrew, D. M., Kilrock, Bridge of Allan  
 1873 Macandrew, Henry C., Sheriff-Clerk, The Castle, Inverness  
 1862 Macarthur, John, of Barbeck, Banker, Inveraray  
 1840 Macarthur, Major Alexander  
 1842 Macarthur, Duncan, New Zealand  
 1840 Macaskill, Donald, of Rhudnan, New Zealand  
 1853 M'Auslan, J., late Kilbrideg, Cairnlow  
 1865 M'Bean, D., Auchterblair, Carr Bridge  
 1871 McBean, John, New Zealand  
 1871 McBonth, James, Brims, Thurso  
 1863 Macbraire, James, of Bradmawood, Berwick  
 1878 M'Caig, Alex., Kilhilt, Stranraer

## Admitted

- 1878 M'Caig, Peter, Mye, Stranraer  
 1870 M'Call, George, Burrence, Kirkmichael, Lockerbie  
 1870 M'Call, James, Caitloch, Moniaive  
 1868 M'Call, Professor James, Veterinary College, Glasgow  
 1846 M'Call, Henry, of Daldowie, Glasgow  
 1874 McCallum, Alex. Inglis, Chemist and V.S., 5 Grassmarket, Edinburgh  
 1872 McCallum, Dun., Glenmachrie, Oban  
 1842 M'Callum, George Kellie, of Braco, Castle Braco, Perthshire  
 1879 M'Callum, James, Fendoch, Crieff  
 1861 M'Callum, John, Bank Place, Crieff  
 1875 McCamon, John, Kirronrae, Kirkcolum  
 1864 M'Candlish, Jn. M'Gregor, W.S., 27 Drumsheugh Gardens, Edinburgh  
 1871 McCash, John, Grain Merchant, Perth  
 1873 McCaull, Peter, Dykehead, Dunblane  
 1851 M'Caw, Alexander, New Zealand  
 1857 M'Chlery, Henry, London  
 1851 M'Clean, Alex. H., Auchneel, Stranraer  
 1880 M'Clellan, Rev. John Brown, Royal Agricultural College, Cirencester  
 1878 M'Clew, David Andrew, Dinvin, Portpatrick  
 1870 M'Clew, John, Dinvin, Portpatrick  
 1878 M'Clure, William, Banker, Lockerbie  
 1879 M'Coll, Duncan, Clachan, Lismore, Oban  
 1840 M'Combie, J. Boyn, Advocate, Aberdeen  
 1858 M'Combie, Peter, Upper Farmton, Whitehouse, Aberdeen  
 1858 M'Combie, Robt., Brawliemuir, Drumlithie  
 1840 M'Combie, William, of Easter Skene, Skene, Aberdeen  
 1878 M'Conchie, Andrew, Mains of Penninghame, Newton-Stewart  
 1878 M'Conchie, John, Carsewillock, Creetown  
 1857 M'Connachy, Archibald, Machremore, Campbeltown  
 1858 M'Connach, Chas., Cairnballoch, Alford, Aberdeen  
 1868 M'Connell, Frederic, Cleughhead, Annan  
 1874 M'Connell, William, of Knockdolian, Girvan  
 1842 M'Connell, John, Richmond, Surrey  
 1857 M'Connell, John A., Chapelheron, Whitehorn  
 1878 M'Connell, Thomas M., V.S., Wigtown  
 1878 M'Connell, Primrose, Castle Mains, New Cumnock—*Free Life Member*  
 1878 M'Cormick, John, Lochlenkit, Corsock, Dalbeattie  
 1880 M'Corquodale, William, Scone Palace, Perth  
 1877 M'Cosh, Peter, Cairngawn, Drumore, Kirkmaiden  
 1877 M'Cracken, Alex. Earl, Gillespie, Glencuce  
 1878 M'Cracken, William, Blackhall, Kirkwhelpington, Newcastle-on-Tyne—*Free Life Member*  
 1859 M'Culloch, Alexander, of Glen, Gatehouse of Fleet  
 1870 M'Culloch, David, Bank-Agent, North Berwick

## Admitted

- 1870 M'Culloch, John, Illinois Trust and Savings Bank, Chicago, Ill., U.S.  
 1878 M'Culloch, Peter, jun., Whitefield, Glencuce  
 1869 M'Culloch, R. C., Kirkland of Longcraig, Kirkcinner  
 1849 M'Culloch, Walter, of Ardwell, Gatehouse of Fleet  
 1871 M'Culloch, William, Crieff  
 1858 M'Diarmid, Charles A., Rookwood, Killin  
 1858 M'Diarmid, D. A., Killimore, Aushnacraig, Mull  
 1875 M'Diarmid, Duncan, Camuserricht, Rannoch  
 1881 Macdiarmid, H., Factor, Tireo, Tobermory  
 1838 M'Donald, Dr Alex., Prince Edward's Island  
 1841 Macdonald, Alexander, Wine Merchant, Inverness  
 1854 Macdonald, A., of Edenwood, Balranald, Lochmaddy  
 1874 Macdonald, Alex., Nether Largie, Kilmartin  
 1874 Macdonald, Alex. Ronald, Ord, Isle Ornsay, Broadford, Skye  
 1855 Macdonald, Archd. Burns, of Glencoe, Perth  
 1855 Macdonald, A. S., Cyderhall, Dornoch  
 1860 Macdonald, D., Athole Arms Hotel, Blair Athole  
 1868 M'Donald, Donald, Culcraggie, Alness  
 1872 Macdonald, Donald, The Park, Nairn  
 1879 Macdonald, Donald, Inverness  
 1869 Macdonald, D. J. K., of Sanda, London  
 1865 Macdonald, D. P., Invernevis, Fort-William  
 1871 M'Donald, J., Comrie Farm, Aberfeldy  
 1875 M'Donald, John Newton, Lochmaddy  
 1873 Macdonald, John, Portfield, Renfrew  
 1879 Macdonald, John, Belmore, Gareloch, Helensburgh  
 1880 Macdonald, Montague, yr. of St Martins, Perth  
 1873 M'Donald, Neil M'Leod, of Dunach, Oban  
 1861 Macdonald, Peter, The Douglas Hotel, Brodick, Ardsrossan  
 1868 Macdonald, R., Glny Castle, Aberdeen  
 1874 Macdonald, R. A., Ullinish, Portree  
 1826 Macdonald-Robertson, William, of Kinlochmoidart, Fort-William  
 1874 Macdonald-Robertson, W. D. A., yr. of Kinlochmoidart, Fort-William  
 1839 Macdonald, Roderick G., of Castle Teirim, Prince Edward's Island  
 1861 Macdonald, William, of Balnakilly, Blairgowrie  
 1874 Macdonald, William, Editor, *North British Agriculturist*, Edinburgh  
 1871 M'Donald, William, Woodlands, Perth  
 1860 Macdonald, William S., Craigielaw, Longniddry  
 1865 Macdonald, William, Banker, Elgin  
 1844 Macdonald, Lieut.-Col. Wm. Macdonald, of St Martins, Perth  
 1846 Macdonell, Eneas Ranald, of Morar, Fort-William

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## Admitted

- 1865 M'Donnell, Jas., of Logan, Stranraer
- 1868 M'Dougal, George, Blythe, Lauder
- 1875 M'Dougal, Thos., Eskdale, Penicuik
- 1872 M'Dougal, Col. Chas. A., of Dunollie, Oban
- 1871 M'Dougall, John, Goodlyburn, Perth
- 1860 M'Dougall, Archibald, Ardalanuig, Kenmore
- 1838 Macdonnell, Captain James Patrick
- 1871 M'Dougall, John W., yr. of Orchill, Blackford
- 1878 M'Dougall, William, Bochartie, Callander
- 1860 M'Dowall, Andrew, Auchtralure, Stranraer
- 1870 M'Dowall, Andrew, Malcolmstone, Currie
- 1880 M'Dowall, A. II., Seedanan, Stranraer
- 1845 Macdowall, Henry, of Garthland, Lochwinnoch
- 1875 Macdowall, Henry, yr. of Garthland, Lochwinnoch
- 1877 M'Dowall, James, 34 St Enoch Square, Glasgow
- 1878 M'Dowall, T. N., Auchtralure, Stranraer
- 1878 M'Dowall, Robert, Auchengallie, Port-William
- 1874 Macduff Alex., of Bonhard, Perth
- 1879 MacDuff, Donald, Tonnagrew, Dunkeld
- 1860 MacDuff, James, Newmill, Stanley
- 1876 M'Duff, Wm., Tonnaguirn, Dunkeld
- 1834 MacEwan, J., of Tar of Ruskie, Callander
- 1846 M'Ewan, Alexander, late of Sunderland
- 1873 M'Ewan, William, Cambushinnie, Dunblane
- 1860 M'Ewen, John, Merchant, Glasgow
- 1864 M'Ewen, John, Redside Farm, North Berwick
- 1865 M'Ewen, John, Merchant, Stirling
- 1865 MacEwen, John C., Inverness
- 1877 M'Fadyean, Prof. John, Vet. College, Clyde Street, Edinburgh
- 1878 M'Farlan, George, Forester, Closeburn Mains, Thornhill
- 1851 M'Farlan, John, Faslane, Garelochhead
- 1874 Macfarlane, Alex. (Mealldarroch, Tarbert, Lochline), 27 Palmerston Buildings, Greenock
- 1857 Macfarlane, Alexander, Pollanilline, Campbelltown
- 1873 M'Farlane, Colin, Strone, Glenfruin, Garelochhead
- 1879 Macfarlane, Dr David, Drymen
- 1880 Macfarlane, David, Needburn, Methven
- 1867 Macfarlane, Donald, Auchray, Aberfoyle
- 1860 Macfarlane, Donald, Balmuldy, Bishopbriggs
- 1873 M'Farlane, Duncan, Greenfield, Garelochhead
- 1857 Macfarlane, Duncan, Torr, Helensburgh
- 1869 M'Farlane, James, of Easter Raderrie, Dunfermline
- 1857 Macfarlane, John, late of Ballenceroch, Lennoxtown
- 1872 Macfarlane, John, Hillhead, Glasgow
- 1873 Macfarlane, Lewis, Lettermay, Lochgoilhead
- 1863 Macfarlane, Malcolm, Hutchestown Farm, Dunblane

## Admitted

- 1879 M'Farlane, Richard, 1 Great Western Terrace, Glasgow
- 1878 Macfarlane, Samuel, Meadowbank, Torrance of Canispie
- 1879 Macfarlane, Walter, 22 Park Circus, Glasgow
- 1879 M'Farlane, Wm., Agricultural Implement Maker, Welltown, Moigle
- 1862 Macfie, G., of Gogarburn, Corstorphine
- 1865 Macfie, David J., of Borthwick Hall, Heriot
- 1864 Macfie, Robert Andrew, of Dreghorn, Colinton
- 1860 Macfie, Samuel, 29 Whitefield Road, Everton, Liverpool
- 1869 Macfie, Wm., of Clermiston, Corstorphine
- 1865 M'Gavin, Robert, of Ballumbie, Dundee
- 1863 M'Gibbon, David, Arduacraig, Campbeltown
- 1860 M'Gill, James, Banker, Dumfries
- 1850 M'Gill, John, Barsalloch, Wigton
- 1878 M'Gill, William, Boreland, Newton-Stewart
- 1879 M'Gillivray, Allan, Gordon Hall, Kingussie
- 1876 MacGillivray, Dr D. W., Eoligary, Barra, Lochmaddy
- 1874 M'Gillivray, John, Ballachroan Kinussie
- 1876 MacGillivray, Wm., Eoligary, Barra, Lochmaddy
- 1876 M'Goune, John G., Mains, Alexandria, N.B.
- 1877 M'Gowan, Robert, Blegbie, Upper Keith
- 1870 M'Gowan, William, Blegbie, Upper Keith
- 1837 Macgregor, Alexander, London
- 1879 M'Gregor, Alexr. (Harrison, M'Gregor, & Co.), Leigh, Lancashire
- 1877 M'Gregor, Arch., Glenlyon House, Aberfeldy
- 1872 M'Gregor, Donald, Bullfinch
- 1870 M'Gregor, Donald, Royal Hotel, Edinburgh
- 1857 Macgregor, Donald R., Merchant, Leith
- 1874 Macgregor, Rev. J., Knockbain Manse, Maudochy
- 1874 M'Gregor, James G., Fearn, Rutshire
- 1861 M'Gregor, John, Ladywell, Dunkeld
- 1878 M'Gregor, John B., Curroch Farm, Crieff
- 1874 MacGregor, P. Comyn, of Broadland, Louisa House, Paisley
- 1878 M'Gregor, Robert, Bellbridding, Dumfries
- 1874 M'Gregor, Roderick, of Brae Hamoch, Kinross, Kingussie
- 1865 MacGregor, Thomas, Kingsmills Road, Inverness
- 1870 M'Haffie, Wm. J., of Torhousemuir, Wigton
- 1872 M'Ilraith, James, 135 Hope St., Glasgow
- 1871 M'Ilraith, Thos., Barwhunmy, Kirkcinner
- 1878 M'Ilwrick, Alex., Northleigh, Witney, Oxon
- 1872 M'Indoe, James, Glenmolachan, Innes
- 1864 MacIndoe, Robert, Murkins, Alexandria
- 1827 M'Inroy, Lieut.-Colonel William, of The Burn, Brechin

## Admitted

- 1864 M'Intosh, David, of Havering Park, Romford, Essex  
 1852 M'Intosh, Lieut.-Gen., of Campsie, K. H.  
 1879 M'Intosh, George, S.S.C., 87 George Street, Edinburgh  
 1878 M'Intosh, James, Boatlands, Coupangus  
 1878 M'Intosh, Dr. Murthly, Perthshire  
 1865 M'Innes, Duncan, of Cowden, Comrie, Crieff  
 1875 M'Intyre, Daniel, Dunallan, Rothesay  
 1861 MacIntyre, Donald, Tighnablair, Comrie  
 1875 MacIntyre, Peter Brown, Mains of Findon, Dingwall  
 1875 M'Intyre, Robert, St Martins, Conon Bridge  
 1844 MacIntyre, J., Lochvoil Cottage, Oban  
 1857 M'Isaac, John, Dunglass, Campbeltown  
 1879 M'Isaac, John, Brae of Monzie, Crieff  
 1850 M'Iver, Evander, Scourie House, Lairg  
 1877 Mackay, Alex. Forbes, of Blackcastle, Carskey House, Campbeltown  
 1878 Mackay, Arch. M., Bruchag, Rothesay  
 1878 Mackay, David, Hukledale, Cummertrees, Annan  
 1872 Mackay, George G., Grangemouth  
 1879 Mackay, George Grant, of Glengloy, Kingussie  
 1877 Mackay, Henry, Shandwick Mains, Nigg, Ross-shire  
 1870 Mackay, H. M. S., Banker, Elgin  
 1872 Mackay, John S., Banker, Grangemouth  
 1870 Mackay, R. J., Burgie Lodge, Forres  
 1874 Mackay, Wm., Melness, Princes Street, Thurso  
 1877 M'Kay, Wm., Brucefield, Portmahomack, Ross-shire  
 1875 Mackay, Thomas, Easter Moy, Arcan, Beaully  
 1857 M'Kean, Robert, Lumloch, Bishopbriggs  
 1880 M'Keand, P., yr. of Airies, Scour Farm, Bunessan, Mull  
 1855 M'Kechnie, Neil, Dunoon  
 1854 Mackechnie, James, Dalmore House, Oban  
 1869 Mackechnie, James, jun., Dalmore House, Oban  
 1878 M'Kellar, John, Kilinan, Bowmore, Islay  
 1878 Mackellar, Peter, Crossalg, Kintyre, Tarbert  
 1880 Mackenzie, Allan T., yr. of Kintail, Leys Castle, Inverness  
 1862 MACKENZIE, Sir Alexander M., of Delvine, Bart., Dunkeld  
 1846 Mackenzie, A., of Seatwell, 19 Charlotte Square, Edinburgh  
 1869 Mackenzie, Alexander Kincaid, of Ravelrig, Currie  
 1875 Mackenzie, Alex., Merchant, 42 Church Street, Inverness  
 1878 Mackenzie, Alex., Tomich, Beaully  
 1872 Mackenzie, Andrew, Dalmore Distillery, Alass  
 1872 Mackenzie, Colin, W.S., 28 Castle Street, Edinburgh  
 1869 Mackenzie, C. J., of Portmore, Eddleston  
 1844 Mackenzie, Daniel, jun., Merchant, Glasgow

## Admitted

- 1846 MACKENZIE, Sir Evan, of Kileoy, Bart.  
 1870 Mackenzie, James, Camden Quay, Cork  
 1865 Mackenzie, James Fowler, of Allaugrange, Munlochy  
 1868 Mackenzie, Major James Dixon, of Finglon, Mountgerald, Dingwall  
 1838 MACKENZIE, Sir James J. R., of Seatwell, Bart.  
 1871 Mackenzie, James T., of Kintail and Glenmuick, Ballater  
 1848 Mackenzie, John, New Club, Edinburgh  
 1865 Mackenzie, John, Duchlago, Cove, Greenock  
 1872 Mackenzie, John, of Knipoch, Oban  
 1853 Mackenzie, Jn. Munro, of Morinish, Garrison Tower, Wishaw  
 1879 Mackenzie, John, W.S., 16 Royal Circus, Edinburgh  
 1848 Mackenzie, John Ord, of Dolphinton, W.S., 9 Hill Street, Edinburgh  
 1821 Mackenzie, John Whiteford, W.S., 16 Royal Circus, Edinburgh  
 1854 MACKENZIE, Sir K. S., of Gairloch, Bart., Conan House, Dingwall  
 1846 Mackenzie, K. W. Stewart, of Seaforth, Brahan Castle, Dingwall  
 1879 Mackenzie, Murdo, Banker, Tain  
 1879 Mackenzie, Neil, Northfield, West Pleas, Stirling  
 1874 Mackenzie, Nigel Banks, British Linen Bank, Fort-William  
 1838 Mackenzie, Robert D., of Caldarvan, Alexandria  
 1865 Mackenzie, Roderick G., of Flowerburn, Fortrose  
 1846 Mackenzie, Thomas, of Ord, Beaully  
 1862 Mackenzie, William, Achindunie, Alass  
 1878 M'Kenzie, William, Inverquharie, Kirriemuir  
 1857 M'Kerral, A., Brunerican, Campbeltown  
 1874 M'Kerrow, And., Auchenskeoch, Southwick, Dumfries  
 1876 M'Kerrow, M. S., Boreland of Southwick, Dumfries  
 1878 M'Kersie, James, Cunningham House, Muirkirk  
 1865 Mackessack, J., Earnside, Forres  
 1865 Mackessack, Charles, Culblair, Fort-George Station  
 1857 Mackessack, John, Balnaffery, Forres  
 1874 Mackessack, John, Kinloss, Forres  
 1864 Mackessack, Robert, of Ardyce and Rosaisle, Forres  
 1874 Mackie, Alexr., Banderth, Stirling  
 1875 M'Kie, Andrew, Blakot, (Crocketford, Dumfries  
 1860 Mackie, George, of Dunjarg, Castle-Douglas  
 1873 Mackie, James H. J., Invermay, Bridge of Earn  
 1869 Mackie, James, Lewes, Fyvie  
 1864 Mackie, James Logan, Ravelston, Great Western Road, Glasgow  
 1860 Mackie, John, Sarkshields, Redefachan  
 1878 M'Kie, John, of Barguile, Castle-Douglas  
 1878 M'Kie, John G., of Auchencalm, Castle-Douglas  
 1881 Mackie, Peter, East Kirkton, Auchterarder

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## Admitted

- 1857 Mackie, Robert, Loudoun Cottage, Galston
- 1871 Mackie, William, Petty, Fyvie
- 1879 Mackill, John (Laidlaw & Co.), 29 Waterloo Street, Glasgow
- 1872 Mackinlay, Daniel, 11 James Street, Portobello
- 1818 Mackinlay, John, Whitehaven
- 1869 M'Kinlay, John, Hardhill, Bathgate
- 1878 Mackinlay, William, Ardoch, Cardross
- 1869 M'Kinnel, J. B. A., Dumfries Iron Works, Dumfries
- 1878 M'Kinnel, William, Butterhole, Buittle, Dalbeattie
- 1869 Mackinnon, Lachlan, jun., Advocate, Aberdeen
- 1876 Mackinnon, Wm., of Loup, Clachan, Kintyre
- 1865 Mackintosh, C. Fraser, of Drummond, M.P., Inverness
- 1846 Mackintosh, Aeneas, of Balmespick, Inverness
- 1844 Mackintosh, Aeneas W., of Raigmore, Inverness
- 1844 Mackintosh, A., of Holme, Inverness
- 1868 Mackintosh, C. H. (of Dalnanzie, Perthshire), M.D., Morlen Hall, Torquay
- 1846 Mackintosh, George Gordon, Richmond House, Twickenham, Middlesex
- 1869 Mackintosh, James, of Lamanoha, Lamanoha
- 1877 Mackintosh, John, South Kinrara, Aviemore
- 1854 Mackintosh, R. T., Seedsman, 12 Melbourne Place, Edinburgh
- 1874 M'Kirdy, Major-General D. Elliot (of Letham, Lanarkshire), New Club, Edinburgh
- 1850 M'Kirdie, John Gregory, of Birkwood, Lesmahagow
- 1860 M'Knight, Alexander, London
- 1856 MacLachlan, Alexander, Carleith, Dunrother
- 1873 M'Lachlan, Archd., 32 Queen Street, Stirling
- 1875 M'Lachlan, Colin, Drums, Greenock
- 1873 M'Lachlan, Colin, Woodend, Helensburgh
- 1874 M'Lachlan, D., Lochgilphead
- 1872 MacLachlan, James, Doune Lodge, Burn of Cambus, Stirling
- 1862 MacLachlan, W. A., of Auchentorrig, Balfron
- 1876 Macne, Alex. Crum, of Cathkin, Carmunnock
- 1853 MacLagan, D., M.D., Prof. of Medical Jurisprudence, University of Edinburgh, 28 Heriot Row
- 1869 MacLagan, David, C.A., 9 Royal Circus, Edinburgh
- 1847 MacLagan, Peter, of Pumpherston, M.P., Clifton Hall, Ratho
- 1873 MacLagan, Robert Craig, M.D., 5 Coates Crescent, Edinburgh
- 1847 MacLaine, Hugh, Glenrisdell, Tarbet, Kintyre
- 1870 MacLaine, Murdoch G., of Lochluby, Oban

## Admitted

- 1855 MacLanachan, James, Van Diemen's Land
- 1879 M'Laren, Charles, Cally Lodge, Dunkeld
- 1853 M'Laren, Duncan, Newington House, Edinburgh
- 1873 M'Laren, James, Little Hauchie, St Ninians
- 1839 MacLaren, Dr John, Blairgowrie
- 1871 M'Laren, James, Solicitor, Crieff
- 1864 M'Laren, J., late Gogar Park, Corstonphine
- 1873 M'Laren, John, Craggish, Coumrie
- 1858 M'Laren, John, Retreat House, Seone, Perth
- 1859 M'Laren, John, Brae of Monzievaird, Crieff
- 1880 M'Laren, John, Midland Engine Works, Hunslet, Leeds
- 1859 M'Laren, Joseph (late Greenhead of Arnot, Kinross), Australia
- 1879 M'Laren, William, Pittendrig, Meikleour
- 1876 M'Larin, Dougald, Dalbeattie
- 1875 M'Latchie, William, Hillside, Campbeltown
- 1877 M'Lean, Alex. T., of Ardgour, Fort-William
- 1835 Maclean, Colonel Allan Thomas
- 1837 Maclean, Archibald D., London
- 1875 M'Lean, Arch. John, of Pennyross, Carraig, Pennyghael, Oban
- 1875 Maclean, Chas., Milton, South Uist, Lochmaddy
- 1838 Maclean, Colin, of Lagan, Islay
- 1861 Maclean, Duncan, Bellinollow, Crieff
- 1849 MacLaine, George, 6 Albert Drive, Crosshill, Queen's Park, Glasgow
- 1854 Maclean, Hector Frederick, W.S., 3 Hill Street, Edinburgh
- 1878 Maclean, Hugh, Law Agent, Strunraer
- 1878 M'Lean, James, Auctioneer, Annan
- 1860 Maclean, James, Clerk of Supply, Wigtown
- 1881 Maclean, J. Grant, Stockbroker, Stirling
- 1823 Maclean, Dr Lachlan, Columbia Cottage, Oban
- 1846 MacLennay, Alex. D., Conservative Club, London
- 1839 MacLennay, Kenneth, 1 Portland Place, London, W.
- 1875 M'Leish, Dan., Bank of Scotland, Fort-William
- 1877 MacLesh, G. S., Wester Drummartharty, Spittalfield, Dunkeld
- 1880 MacLesh, William, Town-Clerk, Perth
- 1871 M'Lellan, David, of Marks, Kirkcubright
- 1857 McLellan, T., North Balfarn, Kirkcinner
- 1875 MacLennan, Alex., Loanassie, Kintail
- 1865 MacLennan, Donald, Hilton, Beauty
- 1864 MacLennan, John, Pearnig, Strone Ferry
- 1874 Macleod, Dun. D. M'L., Coulmore, Inverness
- 1875 M'Leod, F. H., 30 Ann Street, Glasgow
- 1849 Macleod, John N., Banker, Kirkcaldy
- 1839 Macleod, Norman, of Macleod, South Kensington Museum, London
- 1854 Macleod, R. B. Aeneas, of Cadhall, Invergordon Castle, Invergordon



## Admitted

- 1865 Macleod, W. A., Scorrybreck, Portree  
 1875 Macleod, Captain, of Orbost, Skye  
 1874 M'Master, Allen, Glenhead House, Stranraer  
 1871 M'Master, Hugh, Blairbuie, Port-William  
 1878 M'Master, James, Currochtree, Stranraer  
 1875 M'Master, John, Culhorn Mains, Stranraer  
 1875 M'Master, Wm., Challoch, Dunragit  
 1870 M'Millan, John, of Glencrosh, Moniaive  
 1861 MacMillan, J. G., Dereel House, Barns Park, Ayr  
 1854 M'Minn, F., 1 Graham Street, Edinburgh  
 1870 M'Monies, James, Whittlebury, Towcester  
 1872 M'Murrich, James, Stuckievullich, Arrochar  
 1873 M'Murrich, Peter, Burnside, Alva  
 1865 M'Nab, Alex., of Technuiry, Glenochil House, Menstrie  
 1873 M'Nab, Donald, Duchlage, Luss  
 1873 M'Nab, James, Glenochil House, Menstrie  
 1872 M'Nab, John, Hotel, Arrochar  
 1873 M'Nab, John, Bracklin, Callander  
 1879 MacNab, R. W., Union Bank of Scotland, Dalbeattie  
 1865 Macnaughton, Stuart, of Inver Trossachs, Bitterne Manor House, Southampton  
 1857 M'Nair, James, Smerby, Campbeltown  
 1857 M'Nair, John, 33 Moray Place, Edinburgh  
 1876 M'Nair, Robert, Westertown, New Kilpatrick  
 1857 M'Naughton, Alex., Remony, Kenmore  
 1859 M'Naughton, Alex., Kerrowmore, Glenlyon, Aberfeldy  
 1870 M'Naughton, Daniel, 79 Mark Lane, London, E.C.  
 1878 M'Naughton, Duncan, late Cashlie, Glenlyon, Aberfeldy  
 1854 Macnaughton, J., of Smithfield, Ayr  
 1871 M'Naughton, John, Inverlochlaire, Balquhider  
 1879 M'Naughtan, Robert, Inverardran, Crianlarich, Stirling  
 1871 M'Naughton, Wm., Riechip, Dunkeld  
 1848 Macneal, H., of Ugadale, Campbeltown  
 1870 M'Neille, Alex., Redcastle, Dalbeattie  
 1846 M'NEILL, Right Hon. Sir John, G.C.B., Burnhead, Liberton  
 1860 M'NEILL, Col. Sir John Carstairs, of Colonsay, V.C., K.C.M.G., C.B.  
 1861 M'Neillie, W., of Castlehill, Dumfries  
 1873 M'Nicol, John, Garve, Glendarnel  
 1876 M'Nicol, John, Salachael, Fasnacloich, Appin  
 1867 M'Niven, Alex., Inneshevan, Killin  
 1876 Maconchy, John Arthur, Corrinagh, Torquay—Free Life Member.  
 1877 Maconochie, Jn. Allan, Gattonside House, Melrose  
 1852 Maconochie, Robert Blair (of Gattonside, Melrose), W.S., 10 Hill Street, Edinburgh  
 1857 M'Phail, Alex., America

## Admitted

- 1878 MacPhedran, J. M., of Craigbet, Bridge of Weir  
 1878 Macpherson, Allan, of Blairgowrie  
 1878 Macpherson, Charles G. Brewster, of Belleville, Kingussie  
 1871 MacPherson, Donald, Glen Nevis, Port-William  
 1875 M'Pherson, Donald, Auburn Cottage, Pollokshields  
 1876 M'Pherson, Donald, Argyle Arms Hotel, Inveraray  
 1865 Macpherson, Duncan, Kingussie  
 1827 Macpherson, Ewen, of Cluny Macpherson, Cluny Castle, Kingussie  
 1872 Macpherson, George G., Brodie Cottage, Forres  
 1876 Macpherson, John, Achlochrach, Glenrinnies, Dufftown  
 1856 Macpherson, John, Blantyre Farm, Glasgow  
 1857 Macpherson, J., Lord Chamberlain's Office, London  
 1860 Macpherson, J. (late Killibuntly, Kingussie), Ontario, Canada  
 1870 Macpherson, Colonel Lachlan, of Glen-truin, Newtonmore  
 1871 M'Pherson, Lauchlan, Laggan, Crieff  
 1857 M'Queen, J., of Boquapple, Thornhill, Stirlingshire  
 1870 Macqueen, James, of Crofts, Dalbeattie  
 1873 MacQueen, James, Divers Wells, Alloa  
 1879 MacQueen, Jas., Salutation Coach Office, Perth  
 1879 M'Queen, John, Oakwood, Selkirk  
 1850 Macrae, Don., 72 Buccleuch Street, Glasgow  
 1874 Macrae, Dun. A. of Monar, Muirton House, Inverness  
 1874 MacRae, Rod., Mains of Erchless, Beauly  
 1878 M'Raw, Donald, Balnacraig, Fortingall  
 1868 M'Robbie, Peter, Sunnyside, Aberdeen  
 1871 M'Rosty, Jas., Solicitor, Crieff  
 1879 MacRitchie, David, C.A., 7 North St Andrew Street, Edinburgh  
 1873 MacTaggart, Charles, Banker, Campbelltown  
 1876 M'Taggart, John, Culnaightry, Castle-Douglas  
 1857 M'Tavish, Duncan, America  
 1848 Maclier Alexander Walker, late of Durris, Aberdeen  
 1878 M'Tier, John, of Ladyfield, Netherwood, Dumfries  
 1880 M'Turk, Alex., Commercial Hotel, Sanquhar  
 1878 M'Turk, David, Rascarril, Castle-Douglas  
 1878 M'Turk, William A., Barlae, Dalry, Galloway  
 1877 M'Vicar, Archd., Woodend, Bathgate  
 1828 Macvicar, Rev. J. G., D.D., Moffat  
 1878 M'Whinnie, Alex., Arleyollund, Port-William  
 1876 M'William, Mrs. Buchanan, Huntly  
 1869 M'William, D., Cairnfield, Kirkcubbin  
 1876 M'William, James, Stoneytown, Boharm, Keith  
 1870 M'William, Robt., Craichmore, Stranraer  
 1839 Madden, Henry R., M.D., Australia

Admitted

- 1875 Mathison, Henry, The Lindeus, Darlington  
1870 Main, Geo. Agnew, Portland Square, Carlisle  
1874 Main, Jas. A. R. (A. & J. Main & Co.), Pope Street, Glasgow  
1879 Main, R. R. (A. & J. Main & Co.), Possil Park, Glasgow  
1877 Maitland, David, of Dundrennan, Kirkcudbright  
1871 Maitland, Henry, Pilmuir Cottage, St Andrews  
1858 Maitland, James, jun., Little Methlick, Methlick  
1867 MATTLAND, Sir James Ramsay Gibson, of Clifton Hall, Bart, Craigend House, Stirling  
1879 Maitland, Col. Keith Ramsay, H.M.I.S., 26 Castle Terrace, Edinburgh  
1875 Maitland, Robert, Balhagard, Inverurie  
1858 Maitland, Wm., Alton of Coynach, Mintlaw.  
1879 Makenzie, Alexander Donald (Makenzie & Moneur), Upper Grove Place, Edinburgh  
1869 Malcolm, George, Factor, Invergarry  
1876 Malcolm, Wm., Carsaig, Mull  
1840 Malcolm, W. F., of Burnfoot, Langholm  
1878 Malcolm, Wm. Maitland, Carsaig, Pennyghael  
1880 Malcolm, Wm. Taylor, Dunmore, Stirling  
1880 Mangin, W. N., Catslackburn, Yarrow, Selkirk  
1861 Mangles, George, Givendale, Ripon, Yorkshire  
1840 MAXWELL, Sir John, Bart., Maestello, Llandilo, Carmarthenshire  
1833+MAXWELL, Right Hon. the Earl of, K.T., Seone Palace, Perth  
1869 Mansfield, Jas. L., Advocate, 10 Albany Street, Edinburgh  
1872+MAR and KELLE, Right Hon. the Earl of, Allon Park, Alloa  
1855 MARJORIBANKS, Sir Dudley Coutts, of Gairsachan, Bart., M.P., Beaulieu  
1854 MARJORIBANKS, Sir John, of Lees, Bart., Collieston  
1856 Marjoribanks, John, Camptoun, Drem  
1854 Marjoribanks, Wm., 9 Learmonth Terrace, Edinburgh  
1877 Mark, John, Craigend, Stow  
1877 Mark, Robert, Agricultural Hall, Leven Street, Edinburgh  
1876 Marr, John, Cairnbrogie, Old Meldrum  
1864 Marr, J. A., late of Alderston, Mid-Caldor  
1855 Marr, Wm. Smith, Upper Mill, Tarves  
1873 Marryat, George Selwyn, late 19 Hope Terrace, Edinburgh  
1873 Marshall, James, of Duncrievie, Milnathort  
1868 Marshall, James (Marshall, Sons, & Co.), Gainsborough  
1847 Marshall, John, Clebrig, Laing  
1877 Marshall, John (Alexander Jack & Sons), Maybole

Admitted

- 1880 Marshall, John, Sandyford, Holytown  
1877 Marshall, Mark, 145 St Vincent Street, Glasgow  
1880 Marshall, Rev. Theodore, Caputh Manse, Dunkeld  
1860 Marshall, Thomas, The Howes, Annan  
1879 Marshall, Walter, of Lochmaloony, Cupar-Fife  
1872 Marshall, Wm. Hunter, of Callander. 25 Heriot Row, Edinburgh  
1875 Martin, Donald T., Auchendennan, Bonthill  
1877 Martin, Edward, 11 Keir Terrace, Glasgow  
1858 Martin, James, Springbank Terrace, Aberdeen  
1879 Martin, Jas., Priestfield, Pittlessie, Ladybank  
1875 Martin, John, Arncliffe, Rothsay  
1874 Martin, John, Beechwood Mans, Corstorphine  
1858 Martin, John, Parkhead Villa, Perth  
1855 Martin, John, Docharn, Boat of Garten, Strathspey, Inverness-shire  
1867 Martin, John M., yr. of Auchendennan, Bloomhill, Carlross  
1854 Martin, Dr N., of Glendale, Dunvegan  
1878 Martin, Thos., Muirhill, Dumfriesshire  
1880 Martin, William, Dardarroch, Dumfries—*Free Life Member*  
1878 Martin, Wm., Larbrax, Stranraer  
1878 Martin, Wm., Town-Clerk, Dumfries  
1859 Mason, Robert, of Corstorphine Hill, Corstorphine Hill House, Corstorphine  
1880 Masson, Rev. Alex., The Manse, Kirkliston  
1874 Masson, John, Tobermory  
1874 Masson, John, Mill of Gammie, Banchoory  
1875 Mather, Edward, The Lee, Edinburgh  
1874 Mather, John Arnes, Dolmes, Nairn  
1873 Mather, Wm., Kirkhill, Newton Mearns  
1846 Matheson, Alex. of Ardross, M.P., Dunvegan House, Strone Ferry  
1878 Matheson, Daniel, Commercial Bank, Lockerbie  
1871 Matheson, Kenneth, Dunfermline  
1853 Mathews, N., Whitehills, Carlisle  
1864 Mathie, James, Banker, Stirling  
1878 Matthews, Andrew Baird, British Linen Bank, Newton-Stewart  
1871 Mathew, P. M., 32 Condes Gardens, Edinburgh  
1877 Maxwell, Captain Alfred P. Constable, of Terregles, Dumfries  
1870 Maxwell, Captain Heron, yr. of Springkell, Ecclefechan  
1861 Maxwell, Edward Heron, of Teviotbank, Hawick  
1865 Maxwell, Francis (of Gribton, Dumfries), Balgona, North Berwick  
1873 Maxwell, George, of Broomholm, Langholm  
1878 Maxwell, George, of Glenlea, New Galloway  
1838 MAXWELL-STUART, Hon. Henry Constable, of Traquair, Innerleithen  
1877 MAXWELL, Sir Herbert Estlin, of Nonreith, Bart., M.P., Whauphill, N.B.

## Admitted

- 1878 Maxwell, James, Screel, Castle-Douglas  
 1880 Maxwell, John, Coachbuilder, Kelso  
 1889 MAXWELL, Sir John H., of Springkell, Bart., Ecclefechan  
 1867 Maxwell, Maxwell Hyslop, of The Grove, Dumfries  
 1869 Maxwell, General Harley, of Portrack, Dumfries  
 1879 Maxwell, Wellwood of Kirkennan, Dalbeattie.  
 1839 Maxwell, Wellwood H., of Munches, Dalbeattie  
 1878 Maxwell, W. J., Terregles Banks, Dumfries  
 1841 MAXWELL, Sir W., of Cardonesh, Bart., Gathouse  
 1875 Maxwell, Wm. Hall, of Dargavel, Bishop-ton  
 1873 Maxwell, Wm. Jardine, yr. of Munches, Dalbeattie  
 1879 Meade-Waldo, E. W., Stonewall, Eden Bridge, Kent  
 1875 Mearns, Rev. Duncan G., Oyne Manse, Aberdeenshire  
 1859 Mears, Wm., 24 Buccleuch Street, Edinburgh  
 1875 Meek, John, Flesher, Whitburn  
 1857 Meiklam, John, of Gladswood, Melrose  
 1854 Meikle, David, 10 Kirk Wynd, Falkirk  
 1858 Meikle, James, Nether Mains, Kilwinning  
 1867 Meikle, John, Seafeld, Bathgate  
 1869 Meikle, Wm., East Breich, West Calder  
 1879 Meikle Wm., East Bonhard, Linlithgow  
 1861 Mein, Andrew Whytock, of Hunthill, Jedburgh  
 1863 Mein, Ben, Roxburgh Barns, Kelso  
 1860 Mein, N. A., Marsh House, Canonbie  
 1863 Mein, William, Seedsman, Crothouse, Kelso  
 1880 Meldrum, D. B., of Kincape, St Andrews  
 1859 Meldrum, J., of Eden Bank, Pittornie, Cupar-Fife  
 1854 Melrose, Jonathan, Coldstream  
 1869 Melrose, Patrick, West Loch, Eddlestone  
 1819 Melville, J. Whyte, of Bennoch, Mount Melville, St Andrews  
 1877 Melvin, Alexander R., Bonnington, Wilkinston  
 1862 Melvin, Chas., Penston, Tranent  
 1849 Melvin, Jas., Bonnington, Wilkinston  
 1876 Menzies, Alexander, Grain Merchant, Airdrie  
 1863 Menzies, Duncan, C.E., 39 York Place Edinburgh  
 1864 Menzies, Duncan, Blairach, Lairg  
 1875 Menzies, Fergus, Blackhall, Dunfermline  
 1841 Menzies, Fletcher Norton, Edinburgh—  
*Secretary of the Society*  
 1879 Menzies, James, Coshieville, Aberfeldy  
 1869 Menzies, James, of Pitnacree, M.D., Bal-linluig  
 1874 Menzies, John, Caledonian Hotel, Inverness  
 1870 Menzies, John, Bankhead, Dunse  
 1849 Menzies, J. A. Robertson, Dunalastair, New Zealand  
 1877 Menzies, Neil James, yr. of Menzies, Scots Fusilier Guards

## Admitted

- 841 MENZIES, Sir Robert, of Menzies, Bart., Farleyer, Aberfeldy  
 871 Menzies, Robt., S.S.C., 5 North St David Street, Edinburgh  
 879 Menzies, Robert, Tugarmuchel, Aberfeldy  
 865 Menzies, Wm., Kallator, Killin  
 880 Menzies, W. G. Stuart, of Culldares, Perthshire  
 1870 Menzies, Wm. J., W.H., 4 George Street, Edinburgh  
 1861 Mercer, Daniel, Achamore, Dunoon  
 1850 Mercer, Grange R., of Gorthy, Glen Tulchan, Perth  
 1861 Mercer, John, Ardnadam, Dunoon  
 1870 Merricks, H. J., Eskhill, Roslin  
 1870 Merricks, J. L., Gunpowder Mills, Roslin  
 1870 Merricks, William, Gunpowder Mills, Roslin  
 1872 Merriles, Robert, 19 Hope Street, Glasgow  
 1875 Merson, James, Craigwillie, Huntly  
 1873 Michael, James, 5 Mackenzie Place, Angle Park, Edinburgh  
 1867 Michie, C. Y., Forester, Cullen House, Cullen  
 1876 Middleton, Alex., Belmont, Aberlecn  
 1875 Middleton, A. A., Rosefarm, Invergordon  
 1864 Middleton, Geo., Comiton, Dingwall  
 1872 Middleton, Jonathan, Davidston, Invergordon  
 1872 Middleton, Jonathan, Clay of Allan, Fearn, Tain  
 1873 Mill, Allan, Dods, Lauder  
 1853 Millar, C. H., of Blair Castle, 5 Palmerston Place, Edinburgh  
 1870 Millar, James, of Priestlands, Dumfries  
 1877 Millar, James, yr. of Waulkmill, Dunfermline  
 1852 Millar, James Lawson, of Waulkmill, Dunfermline  
 1864 Millar, James, Mills of Torr, Blair-Drummond  
 1878 Millar, Robert, Alloway Cottage, Ayr  
 1854 Millar, Thomas, of Baillicies, Dollar  
 1871 Millar, Wm., Over Kinfauns, Perth  
 1843 Miller, O. G., Dundee  
 1873 Miller, Thomas, of Myres, St Ninians  
 1864 MILLER, Sir Wm., of Maulderston, Bart., Dunse  
 1879 Miller, Wm., Pond Cottage, Whitehouse, Aberdeenshire  
 1877 Millican, John, Wedholm House, Abbey Town, Carlisle  
 1870 Millie, George, Kilmaron, Cupar-Fife  
 1878 Milligan, James, Hayfield, Thornhill  
 1870 Milligan, John, Merikand, Dunscore  
 1859 Mills, G., Glennona Park, Bung Bong, Victoria

Admitted

- 1858 Milne, A., Corse of Kinnoir, Huntly  
 1855 Milne, Alex., Mill of Allathan, Uduy  
 1856 Milne, J., Netherton of Pittendrum, Fraserburgh  
 1856 Milne, J., Union Bank of Scotland, Elgin  
 1856 Milne, Jas. (late Meinfoot, Ecclefechan), Airdrie  
 1862 Milne, James, Banker, Huntly  
 1867 Milne, John, Mains of Laithers, Turriff—  
*Free Life Member, 1873*  
 1881 Milne, John, Corn Merchant, Montrose  
 1861 Milne, Peter, 19 Buccleuch Place, Edinburgh  
 1855 Milroy, James, Galdenoch, Stoneykirk  
 1876 Milroy, John, Balgrogan Mains, Stranraer  
 1863 Minto, Right Hon. the Earl of, Minto House, Hawick  
 1870 Minto, John D., Dumfries  
 1876 Mitchell, Alex., Balgreen, King Edward, Banff  
 1851 Mitchell, Alex., of Sauchie, Maybole  
 1857 Mitchell, A., Tillicountry House, Alloa  
 1870 Mitchell, Alex., Implement Maker, Peterhead  
 1848 Mitchell, Andrew, Alloa  
 1874 Mitchell, Andw., Drumderfit, Inverness  
 1875 Mitchell, Andw., Ratagan House, Lochalsh  
 1878 Mitchell, Andrew, Barcheskie, Kirkcudbright  
 1861 Mitchell, David, late Burnton, Laurencekirk  
 1857 Mitchell, Duncan, Arrochar  
 1877 Mitchell, George, Broxburn Park, Broxburn  
 1848 Mitchell, H., of Polmood, 45 Albany Street, Edinburgh  
 1857 Mitchell, Hugh, High Lossit, Campbelltown  
 1877 Mitchell, Hugh, Banker, Pitlochry  
 1851 Mitchell, James, Dologan, Aberystwith  
 1879 Mitchell, James, Merchant, Montrose  
 1874 Mitchell, James R., Drynie, Inverness  
 1857 Mitchell, J., Homeston, Campbeltown  
 1864 Mitchell, James, Banker, Pitlochry  
 1850 Mitchell, J., Ballemenuach, Campbeltown  
 1878 Mitchell, James, Aldie Castle, Kinross  
 1873 Mitchell, John, jun., Boreland, Hulton, Lockerbie  
 1861 Mitchell, John, Fliskmilm, Cupar-Fife  
 1876 Mitchell, John, Lairshill, Summerhill, Aberdeen  
 1864 Mitchell, John, Provost of Dingwall  
 1872 Mitchell, John, Knockhouse, Dunfermline  
 1873 Mitchell, John Forbes, of Thainston, 33 Marlow Road, Kensington, London, W.  
 1836 Mitchell, Joseph, Civil Engineer, View Hill, Inverness  
 1878 Mitchell, Joseph, Bankhead, Dalwinton, Dumfries  
 1870 Mitchell, Joseph M., Burnscraith Green, Dumfries  
 1859 Mitchell, Robert, Brewer, 3 Bonnygate, Cupar-Fife  
 1850 Mitchell, S., Dalivaddy, Campbeltown  
 1880 Mitchell, Thomas, Middlestead, Selkirk  
 1874 Mitchell, William, North Ossemsley, Lynton, Hants

Admitted

- 1876 Mitchell, William, Mains of Biffie, Old D-er  
 1862 Mitchell, Wm., Merchant, Montrose  
 1869 Mitchell, Wm., S.S.C., 15 Magdala Crescent, Edinburgh  
 1863 Mitchell, Wm., Ribigill, Tongue, Sutherlandshire  
 1881 Mitchell, William, Auchlochie, Fearn, Brechin  
 1868 Mitchell, Wm. A., Auchnagathel, Keig, Aberdeen  
 1849 Mitchell, W. G., of Carwood, Biggar  
 1861 Moffat, George, Roseland, Partick, Glasgow  
 1860 Moffat, James, Gateside, Kirkcounell, Sanquhar  
 1867 Moffat, James, of Kenervie, British Linen Bank, Castle-Douglas  
 1869 Moffat, James, Kirkclinton Park, Kirkcudbright, Carlisle  
 1850 Moffat, John, Craick, Hawick  
 1879 Moffat, Robert Thomas, Ardicloich, Moniaivie  
 1862 Moffat, Thomas, Drumbuie, Sanquhar  
 1871 Moir, James, late Banker, Alloa  
 1858 Moir, James, Mains of Wardhouse, Inver, Aberdeen  
 1873 Moir, James M'Arthur, of Hillfoot, Dollar  
 1876 Moir, John, Forilhead, Gargunnoch  
 1876 Moir, Peter, Nottingham Place, Edinburgh  
 1876 Moir, William, Nottingham Place, Edinburgh  
 1873 Morrison, James, Factor, Dochgarroch Lodge, Inverness  
 1842 Moncrieff, Alexander, W.S., Perth  
 1852 Moncrieff, Lt.-Col. Alexander, of Barnhill, Perth  
 1866 Moncrieff, David Scott, W.S., 24 George Square, Edinburgh  
 1848 Moncrieff, Right Hon. Lord, of Tulliebole, Lord Justice-Clerk, 15 Great Stuart Street, Edinburgh  
 1878 Monlawa, Rev. James John, Middlebie Manse, Ecclefechan  
 1833 Monro, A. B., of Auchanbowie, Stirling  
 1851 Monro, David, of Allan, Tain  
 1846 Monteith, B., Tower Mains, Liberton  
 1857 Monteith, Robert, of Carstairs  
 1878 Montgomery, And., Boreland, Castle-Douglas  
 1843 MONTGOMERY, Sir G. Graham, of Stanhope, Bart., Stobo Castle, Stobo—  
*Honorary Secretary of the Society*  
 1879 Montgomery, John, Compston End, Kirkcudbright  
 1846 Montgomery, John H., of Newton, Stobo Castle, Stobo  
 1873 Montgomery, Wm., jun., Parkend Farm, Helensburgh  
 1878 Montgomery, William, Banks, Kirkcudbright  
 1876† MONTROSS, His Grace, the Duke of, Buchanan Castle, Glasgow  
 1839 Moore, John C., of Corsewell, Stranraer  
 1852† Moray, Chas. Stirling Home Drummond, of Blair-Drummond, Stirling  
 1869 Moray, Lieut.-Col. H. D., jr. of Abercairny, Crieff

## Admitted

- 1868 Morgan, David, South Mains of Ethie, Arbroath  
 1878 Morison, Bethune George Walker, of Falfeld, Cupar-Fife  
 1861 Morison, James, Topeka, Kansas  
 1850 Morison, James G., Glasgow  
 1862 Morison, J. B. B., of Finnerley, Kinross  
 1880 MORRIS, Sir John, Wolverhampton  
 1871 Morris, William, V.S., 7 Langstane Place, Aberdeen  
 1877 Morrison, Andrew, Broomrig, Puncatland  
 1855 Morrison, Charles, of Islay, Bridgend, Islay  
 1858 Morrison, Harry L. L., late of Blair, Aberdeen  
 1850 Morrison, James, Glasgow  
 1873 Morrison, James M., Banker, Stirling  
 1876 Morrison, John, junior, Hattonslap, Methlick  
 1859 Morrison, John, West Dalmeny, South Queensferry  
 1876 Morrison, Thomas, 32 Glassford Street, Glasgow  
 1872 Mortimer, Thomas A., 86 George Street, Edinburgh  
 1876 Mortimer, William, Old Keig, Keig  
 1880 Morton, David (Graham & Morton), Stirling  
 1861 Morton, J., Lambieetham, St Andrews  
 1876 Morton, John, Nether Abington, Abington  
 1879 Morton, R. G., Engineer, Errol  
 1859 Mossman, H., of Auchtyfardie, Lanark  
 1843 Moubray, John M., late of Hartwood  
 1878 Moubray, John M., Strone House, Strone, Greenock  
 1880 Moulit, John, 41 Mosley Street, Newcastle-on-Tyne  
 1865 Mounsey, J. T., of Kingfield, Longtown, Cumberland  
 1877 Mounsey, William R., Lowther, Newton, Penrith  
 1867 Muckart, James, Land Steward, Barns House, Maybole  
 1879 Muckersie, Henry, Drumfin, Dunfermlin  
 1878 Muil, James, Grain Merchant, Alloa  
 1880 Muir, John Dryhope, Yarrow, Selkirk  
 1873 Muir, Andrew Lees, Coal Merchant, Stirling  
 1852 Muir, G. W., Kirkhouse, Traquair, Innerleithen  
 1878 Muir, James, Lochfergus, Kirkeudbright  
 1843 Muir, John, late of Gartferrie  
 1877 Muir, William, Lochdougan, Castle Douglas  
 1862 Muirhead, E. W., The Hill, Putney, Surrey  
 1872 Muirhead, F., Eaglescarnie Mains, Haddington  
 1863 Muirhead, George (late Durdie, Errol), London  
 1872 Muirhead, Geo., Paxton, Berwick-on-Tweed  
 1875 Muirhead, Thomas, Townhill Store, Dunfermline  
 1874 Muirhead, Wm., Auchenairst, Bishopbriggs

## Admitted

- 876 Muirhead, William, Melkie Bichorn, Dalbentie  
 873 Muirhead, William, Pirnhall, Bannockburn  
 873 Munby, Edward Chas., Myton Grange, Helpshay, Yorkshire—*Free Life Member*  
 876 Mundell, James P., Perth  
 874 Mundell, John, Gorthlie, Foyers, Inverness  
 878 Mundell, Walter, Kilanreagh, Glenelg  
 881 Mundell, Walter, Moy, Muir of Ord  
 870 Mundell, Walter Grieve, Inverlael, Lochbroom, Dingwall  
 1864 Munro, A., Ballintraid, Invergordon  
 1874 Munro, Alexr., Ord, Invergordon  
 1864 Munro, D., Contin, Dingwall  
 1877 Munro, Duncan H. Campbell, of Kenloch-laich, Mileburn, Glenrock  
 1853 Munro, John, Fairmington, Roxburgh  
 1877 Munro, John, of Swardale and Lamilar, Evanton  
 1874 Munro, John, Seedsman, Inverness  
 1870 Munro, Robert, Coveasa, Duffus, Elgin  
 1870 Munro, William, Kennore, Aberfeldy  
 1880 Munro, William, of Marchbank, Edinburgh  
 1879 Murdoch, Mrs, East Haughead, Uddingston  
 1875 Murdoch, Alex., Gartnair, Shettleston  
 1865 Murdoch, George Burn, Westerton, Polwarth Terrace, Edinburgh—*Free Life Member*  
 1875 Murdoch, James, Carnryne, Shettleston  
 1874 Murdoch, James F., Hallside, Cambuslang  
 1853 Murdoch, John Burn, of Gartnair, Advocate, Greenhill Lodge, Edinburgh  
 1875 Murdoch, John, Carnryne, Shettleston  
 1875 Murdoch, John, Hilton, Bishopbriggs  
 1880 Murdoch, Peter, Househill, Larbert  
 1857 Murdoch, Robert, Hallside, Cambuslang  
 1878 Murdoch, Robert, Kilnietrie, Castle Douglas  
 1856 Murdoch, William, Solicitor, Huntly  
 1847 Mure, Hon. Lord, 12 Ainslie Place, Edinburgh  
 1870 Mure, William J., Advocate, 12 Ainslie Place, Edinburgh  
 1878 Murray, Allan, Castlehill Mill, Lockerbie  
 1879 Murray, Alex., Alderston, Haddington  
 1846 Murray, Andrew, of Conland, 67 Bedford Gardens, Kensington, London  
 1828 Murray, Anth., of Dolerio, W.S., 141 George Street, Edinburgh  
 1880 Murray, Anthony George, C.E., 141 George Street, Edinburgh  
 1877 Murray, A. Graham, Advocate, 7 St Colme Street, Edinburgh  
 1879 Murray, Benjamin Rigby, of Parton, Castle Douglas  
 1880 Murray, Lt.-Col. Chas. Stewart, Sauchie, Stirling  
 1879 Murray, Geo. Rigby, yr. of Parton, Castle Douglas  
 1871 Murray, C. A., Taymount, Stanley  
 1864 Murray, D., Grunard, Ross-shire  
 1879 Murray, David, jun., Dunira, Griffe  
 1860 Murray, Rev. George, of Torquhain, Balmaclean Manse, New Galloway

Admitted

- 1854 Murray, George, New Zealand  
 1865 Murray, G. R., Finlissness, Douglas  
 1867 Murray, G., Elvanston Castle, Derby  
 1869 Murray, G. W., Banff Foundry, Banff  
 1870 Murray, Jack H., Admiral, R.N., East-India, Pitlochry  
 1857 Murray, James, Dumfries Arms Hotel, Cumnock  
 1873 Murray, James, Gartur, Stirling  
 1861 Murray, James, Catar House, Drymen  
 1870 Murray, James, Fauchaulds, King Edward, Banff  
 1860 Murray, James Wolfe, of Cringletie, Peebles  
 1846 MURRAY, Sir John, of Philiphaugh, Bart., Selkirk  
 1862 Murray, John L., of Heavyside, Biggar  
 1863 Murray, Lieut.-Col. John, of Polmaise, Stirling  
 1873 Murray, John, Munnieston, Thornhill, Stirling  
 1863 Murray, John, of Wooplaw, Galashiels  
 1878 Murray, Patrick, Fairyknowe, Ecclefechan  
 1862 MURRAY, Sir Patrick Keith, of Ochter-tyre, Bart., Crieff  
 1850 Murray, Robert, 64 Grove Street, Edinburgh  
 1858 Murray, R., 7 Roxburgh Place, Edinburgh  
 1874 Murray, Robert G., of Spittal, Biggar  
 1875 Murray, Robert W. E., Wester House Byres, Galashiels—*Free Life Member*  
 1857 Murray, Thomas, Braidwood, Penicuik  
 1852 Murray, Thomas G., W.S., 11 Randolph Crescent, Edinburgh  
 1856 Murray, William, Kilcoy, Kilearnan, Inverness  
 1858 Murray, Wm., Mains of Pittendreich, Turrit  
 1879 Murray, W. G. G., Kersknowe, Kelso  
 1859 Mustard, Alex., Leuchland, Brechin  
 1876 Mutch, Alexander, Mains of Newhall, Stonehaven  
 1875 Muttar, John, 20 Chalmers Street, Edinburgh  
 1858 Myers, Geo. C., Town-Clerk, Montrose  
 1864 Myles, James, Deanside, Renfrew  
 1860 Mylne, Thom., Niddrie Mains, Liberton  
 1879 Nairne, Thos. Graham, Lawton House, Coupar-Angus  
 1874 Nairne, William, of Dunsinnane, Perth  
 1843 NAPIER and ERMACK, Right Hon. Lord, K.T., Thirlestane Castle, Selkirk  
 1875 Napier, John S., of Letham, Strathaven  
 1848 NAPIER, Sir R. J. M., of Milliken, Bart., Johnstone, Renfrewshire  
 1857 Napier, Dugald, Australia  
 1840 Napier, George, Advocate, Sheriff of Peeblesshire, Coates Hall, Edinburgh  
 1872 Nares, A. F., Brucktor, Old Meldrum  
 1870 Neilson, Joseph, Killininingan, Kirkgun-zeon, Dumfries  
 1867 Neilson, William, Estate Factor and Banker, Bank of Scotland, Bellshill  
 1871 Nelson, Charles, Skateraw, Dunbar

Admitted

- 1859 Nelson, Michael, Hill of Drip, Stirling  
 1865 NEPEAN, Sir M. H., of Loders Court, Bart., Bridport  
 1845 Newall, John, Mexico  
 1865 Newton, Captain Hay, of Newton, Had-dington  
 Newton, Robert P., of Castlandhill, Pol-mont Bank, Polmont  
 Newton, T. H. G., Burrows Park, Henley-in-Arden, Birmingham  
 1861 Nicholson, Robert, Glencaple, Dumfries  
 1878 Nicholson, William Newzan, Trent Iron Works, Newark  
 1869 Nicol, W. E. (of Ballogie Abeyne), 13 Hyde Park Terrace, London, W.  
 1844 Nicoll, Alexander, late of Edinburgh  
 1867 Nicoll, T. Munro, Littleton, Kilmintyre  
 1867 Nicolson, James Badenach, of Glenbervie, Fordoun  
 1857 Nicolson, Michael Hugh Stewart, of Car-nock, Arngowan, Greenock  
 1873 Nimmo, Alexander, of West Bank, Fal-kirk  
 1852 Nimmo, Matt., Foot of Green, Stirling  
 1881 Nimmo, Thomas, Lawhead, Forth, Lanarkshire  
 1880 Nisbet, George, Rumbleton, Greenlaw, Berwickshire  
 1870 Nisbet, Jas., of Lambden, Greenlaw, Berwickshire  
 1875 Nisbet, John, Longgreen, Newmilns, Kil-marnock  
 1865 Nisbet, Ralph P., Chesterhill House, Belford  
 1847 Nisbett, J. M., of Cairnhill, Drum, Edin-burgh  
 1860 Niven, Alexander T., C.A., 6 Abbotsford Crescent, Edinburgh  
 1873 Nivison, Stewart, Lairdlaugh, Dalbeattie  
 1878 Nixon, R. L., Bonstead Hill, Burgh-by Sands, Carlisle  
 1878 Nonnen, John Edward, 11 Merchiston Park, Edinburgh—*Free Life Member*  
 1862 Norie, Henry Hay, W.S., Perth  
 1860 Norman, William, Hall Bank, Aspatia—*Free Life Member* 1873  
 1880 Normand, William J., Ramornie, Lealy-bank  
 1867 Norris, Peter, Todholes, Fintry, Stirling  
 1879 North, G. F., Cheswardine, Market Drayton  
 1868 OCHTERLONY, Sir Charles Metcalfe, of Ochterlony, Bart., St Andrews  
 1859 Odams, James, London  
 1873 Ogilvie, A. M., Tillynaught, Portsoy  
 1830 Ogilvie, David, Berryfauld, West Kirkton, Arbroath  
 1853 Ogilvie, Wm. R., Skelton, Penwith  
 1860 Ogilvie, George, Holstield, Kelso  
 1868 Ogilvie, Donald, of Clova, Balmaboth, Kilmuir  
 1870 Ogilvy, Col. James W., Rannagulzion, Blairgowrie  
 1824 OGILVY, Sir John, of Inverquhar, Bart. Baldoan House, Dundee  
 36 Ogilvy, John, of Inshewan, 4 Church Hill, Edinburgh

## Admitted

- 1859 Ogilvy, John, Harecraig, Dundee  
 1874 Ogilvy, John Francis, of Corrimony, Glen Urquhart  
 1871 Ogilvy, Reginald Howard Alexander, yr. of Inverquhartry, Millhill, Inchture  
 1844 Ogilvy, Lt.-Col. Thomas W., of Ruthven, Meikle  
 1872 Oliphant, L. J., of Condie, Guards Club, London  
 1873 Oliphant, Thomas T., of Rossie, Queen Mary's, St Andrews  
 1852 Oliver, James, of Thornwood, Hawick  
 1880 Oliver, John, Borthaugh, Hawick  
 1853 Oliver, Robert, of Blakelaw, Lochside, Kelso  
 1858 Oliver, W. Elliot, Benbui, Inveraray  
 1873 Oliver, Wm. M., Howpasley, Hawick  
 1875 Ord, John Robert, Haughton Hall, Darlington  
 1858 Orme, Sir John W. Powlett Campbell, of Kilmory, Bart., Lochgilphead  
 1848 Ormiston, William T., of Glenburn Hall, Jedburgh  
 1873 Orr, James, Hill, Whitburn  
 1875 Orr, James, of Harvieston, Dollar  
 1878 Osborne, D. M., 125 St Anne Street, Liverpool  
 1843 Oswald, James Townsend, of Dunnikier, Kirkcaldy  
 1870 Oswald, Richard A., of Auchincruive, Ayr  
 1863 Otto, Wm. E., Jedneuck, Jedburgh  
 1872 Outhwaite, John, Bainesse, Catterick  
 1873 Ovens, Walter, Torr House, Castle Douglas  
 1876 Ovens, William R. (Thos. Ovens & Sons) Leith  
 1852 Pagan, A. C., Rockclyffe, Crief  
 1875 Pagan, G. H., Banker, Cupar-Fife  
 1872 Panton, Patrick, of Edenbank, Kelso  
 1871 Panton, John, of Dalnagairn and Carsie, Blairgowrie  
 1873 Panton, Wm., Maryfield, Blairgowrie  
 1881 Park, Alexander, Factor, Gartshore, Croy Glasgow  
 1874 Park, Ebenezer, Engineer, Greenside Lane, Edinburgh  
 1863 Park, James, Stoneyhill, Musselburgh  
 1881 Park, James, Dechmont, Cambuslang  
 1873 Park, James D., Engineer, Greenside Lane, Edinburgh—*Practical Engineer to the Society*  
 1866 Park, Thomas B., Springfield, Haddington  
 1881 Park, Walter, Hatton, Bishopton, Erskine, Renfrewshire  
 1874 Park, William, Gallowhill, Paisley  
 1867 Parnell, Dr Richard, 17 Merchiston Avenue, Edinburgh  
 1877 Pate, Andrew, Easter Middleton, Gorebridge  
 1867 Paterson, Charles, Canford Manor, Wimbome  
 1864 Paterson, D. A., Merchant, Leith  
 1870 Paterson, David J., Watch Hall, Annan  
 1877 Paterson, George, Fallhills, Penicuik

## Admitted

- 1877 Paterson, G. R., Drumalbin, Thankerton, Lanarkshire  
 1872 Paterson, Jas., of Kinnettles, Dundee  
 872 Paterson, James, Kildielough, Dundee  
 853 Paterson, James, Whitehouse, Lamlash, Arran  
 860 Paterson, James, of Carmacamp, Douglas  
 878 Paterson, James, of Bankton, Mid-Caldor  
 847 Paterson, John, jun., late Kileonan, Campbeltown  
 857 Paterson, John, Skirling Main, Biggar  
 862 Paterson, John, Howleuch, Moffat  
 873 Paterson, John Thos. Scott, Pleas Farm, Bannockburn  
 877 Paterson, John, Ewingston, Gifford  
 877 Paterson, John, Colbin, Portpatrick  
 877 Paterson, Richard L., Langside, Dalkeith  
 854 Paterson, J. W., Terrona, Langholm  
 878 Paterson, Robert, V.S., Bellevue, Greenbrae, Dumfries  
 848 Paterson, Robert, of Birthwood, Biggar  
 869 Paterson, Thos., W.S., 81A George Street, Edinburgh  
 851 Paterson, Walter, Merchant, Glasgow  
 1870 Paterson, William, of Brocklehurst, Mouswald, Dumfries  
 1874 Paterson, Wm. Grindlay, Scotsburn, Invergordon  
 1865 Paterson, Wm. Innes, Armadale, Thurso  
 1873 Paterson, Wm., Auldtown of Carnousie, Turiff  
 1857 Paton, Alexander, Norwood, Sydenham, London  
 1880 Paton, James, jun., Obney, Bankfoot, Perth  
 1873 Paton, John, Viewforth, Stirling  
 1859 Paton, John, Standingstone, Haddington  
 1833 Paton, John, of Crailing, Kelso  
 1873 Paton, Robert, West Drip, Stirling  
 1865 Patrick, James, late of Kilnun, Argyllshire  
 1873 Patrick, Jas., Queenzieburn, Kilsyth  
 1879 Patterson, Alex., Broombarrow, Forgan-denny, Bridge of Earn  
 1850 Patterson, John, Ballemore, Strachur  
 1850 Patterson, Robert, Queen Street, Stirling  
 1864 Pattison, A. D., of Dalnair, 22 Belgrave Crescent, Edinburgh  
 1872 Pattison, J. P., of The Haining, Selkirk  
 1861 Pattullo, Peter, Easie Farm, Meikle  
 1877 Paul, Gavin, Wilsontown, Lanark  
 1880 Paul, George M., C.S., 16 St Andrew Square, Edinburgh  
 1877 Paul, Walter, Ibert, Killearn  
 1855 Paul, Wm., Advocate, Aberdeen  
 1878 Payne, James, Thornhill  
 1854 Pearson, Andw. A., of Springfield, Carlisle  
 1863 Pearson, David A., Johnston Lodge, Laurencekirk  
 1858 Peat, John, Manor, Stirling  
 1872 Peddie, John Dick, M.P., 33 Buckingham Terrace, Edinburgh  
 1880 Peddie Wm., 11 South Methven Street, Perth  
 1867 Peile, H. R. B., Mansion House, Greenock  
 1864 Pelham, C. Thursty, Coumd Rectory, Shrewsbury

Admitted

- 1865 Pender, John Menzies, Glenlyon Lodge, Nairn  
 1869 Pender, John, M.P., 66 Old Bond Street, London, E.C.  
 1869 Pender, J., Springhill, Stane, Motherwell  
 1878 Pennington, George, Cateane, Gorebridge  
 1868 Penman, John, Bonally, Colinton  
 1859 Penny, Thos., Bartlehill, Coldstream  
 1854 Peter, Thos., Catterland, Montrose  
 1854 Peter, John, Croyard, Beaulieu  
 1875 Peterkin, James Grant, of Grange, Forbes  
 1879 Peterkin, William, Dunglass, Canon Bridge  
 1875 Petrie, Geo., Easter Suddie, Avonch  
 1868 Petrie, James, Banker, Dufftown  
 1871 Petrie, Stephen F., 350 Leith Walk, Edinburgh  
 1870 Petrie, Wm., Kirkhill, Elgin  
 1876 Petrie, W. A., Rosebrae, Elgin  
 1875 Pettigrew, Jas., Cairnhill House, Airdrie  
 1879 Phillips, David, W.S., 41 Charlotte Square, Edinburgh  
 1856 Philip, George, Boynds, Keith Hall, Inverurie  
 1851 Philip, John, Polton East Mains, Lasswale  
 1858 Philip, W., Lofthillock, Keith Hall, Inverurie  
 1864 Philip, Robert, Royal Hotel, Bridge of Allan  
 1876 Picken, Thos., Barsalloch, Port William  
 1857 Picken, James, Laigh Langside, Craigie, Kilmarnock  
 1857 Picken, John, Mansfield Mains, New Cumnock  
 1860 Picken, R., Barnkirk, Newton-Stewart  
 1871 Pirrie, Jas. P., Coachbuilder, Perth  
 1878 Pitblado, Charles B., Charlestown, Dunfermline  
 1878 Pitcairn, Henry H., Tiroran House, Mull  
 1863 Pitcairn, John, 22 Queen Street, St Andrews  
 1859 Pitman, Frederick, W.S., 11 Great Stuart Street, Edinburgh  
 1859 Pittendrig, A., Mains of Park, Lonmay  
 1859 Plenderleith, A., Moorfoot, Gorebridge  
 1860 Plummer, J., 11 Bruntsfield Place, Edinburgh  
 1881 Pollock, George, Seedsman, Stirling  
 1844 Pollok, Allan (of Faside, Mearns), Balinacloe  
 1879 Pollok, John, of Ronachan, Clachan, Greenock  
 1873 Pollok, John, of Blackhouse, Mearns  
 1863 POLWARTH, Right Hon. Lord, Mertoun House, St Boswells  
 1877 Pople, George, Newhouse, Perth  
 1867 Pople, H. W., Royal British Hotel, Perth  
 1861 Pople, J. B., of Newhouse, Perth  
 1880 Porteous, James, Solicitor, Coldstream  
 1878 Porteous, David Scott, of Lauriston, Montrose  
 1877 Porter, George, jun., 27 Wellington Place, Aberdeen  
 1855 Porter, James, Inverurie  
 1880 Pott, George, of Potburn, Linthaughlee, Jedburgh  
 1854 Pott, Gideon, of Knowemouth, Jedburgh

Admitted

- 1867 Potter, James, of Glenfuir, Falkirk  
 1863 Potts, Andrew, Newton, Coupar-Angus  
 1861 Powrie, Archibald, Lairwell, Perth  
 1849 Powrie, James, of Reswallie, Forfar  
 1864 Prentice, George, of Strathore, Newbliging, Burntisland  
 1865 Prentice, R. R., Skeddoway, Kirkcaldy  
 1875 Preston, W. C., Achouachie Lodge, Muir of Ord  
 1873 Pretzell, Jas., Drummelzier Place, Rachan Mill, Biggar  
 1880 Primrose, Alfred G., Dock Street, Dundee  
 1863 Primrose James Thomson, late Sauchland, Ford  
 1875 Pringle, Adam T., 29 Grassmarket, Edinburgh, and India Buildings, Kelso  
 1859 Pringle, Alexander, of Whytbank, Selkirk  
 1863 Pringle, David, of Wilton Lodge, Hawick  
 1863 Pringle, David, Cleethaugh, Jedburgh  
 1876 Pringle, James, 1 Bellevue Place, Edinburgh  
 1863 Pringle, James Thomas, of Torwoodlee, Galashiels  
 1865 Pringle, John, Garryald, Gorebridge  
 1862 Pringle, Robert K., Shorncliffe, Cheltenham  
 1877 Pringle, Wm., Huntly Cote, Gorebridge  
 1880 Proctor, David, Haugh, Manachline  
 1868 Profeit, Dr, Craigowan Cottage, Balmoral, Ballater  
 1868 Proudfoot, T., Pinkiehill, Musselburgh  
 1877 Pudney, R. L., Earls Colne, Hallstead, Essex—*Free Life Member*  
 1864 Pullar, John, Ettrick House, Bridge of Allan  
 1871 Pullar, Robert, Perth  
 1871 Pullar, Wm., Kingussie  
 1865 Pulton, F. H., West Fortune, Drem  
 1872 Purdom, Water, Easter Wooden, Kirkcubright, Kelso  
 1880 Purves, Captain Home, of Purves Hall, Greenlaw, Berwickshire  
 1861 Purves, James, Lochend, Thurso  
 1871 Purves, Thos., Rhisfall, Bettyhill, Thurso  
 1869 Purves, Wm., Thurdistoft, Thurso  
 1844 Purvis, John, of Kinaldy, St Andrews  
 1869 QUEENSBERRY, Most Noble the Marquis of, Kinnmount, Annap  
 1872 Rae, Robt., Burnbank, Foulden, Berwick-on-Tweed  
 1880 Rae, William, Gateslack, Thornhill  
 1870 Rain, Wm., Kempton, Castle-Douglas  
 1867 Raine, Thos., Bridgehaugh, Stirling  
 1879 Rait, James, Culcrieff, Crieff  
 1867 Ralston, Andrew W. (late Lagg, Ayr), America  
 1868 Ralston, Andrew, Glamis, Forfar  
 1870 Ralston, A. R., Genoch, Straiton, Maybole  
 1871 Ralston, James J., Old Faskally, Pitlochry  
 1877 Ralston, John, Milmain, Stranraer  
 1869 Ramsay, Alex., *Banffshire Journal Office, Banff*



## Admitted

- 1871 RAMSAY, Sir James Henry, Bamff, Bart.,  
Alyth  
1856 Ramsay, John, of Kildalton, M.P., Port  
Ellen, Greenock  
1875 Ramsay, John, Butcher, Kilbarchan  
1856 Ramsay, Col. John, of Barra, Straloch,  
Aberdeen  
1841 Ramsay, Robert B. Wardlaw, of White-  
hill, Rosewell  
1881 Ramsay, R. G. Wardlaw, yr. of Whitehill,  
Rosewell  
1837 Ranken, George, Australia  
1874 Ranken, John, Ballencreiff Mains, Long-  
niddry  
1878 Rankin, Alex., Aird, Stranraer  
1886 Rankin, Geo., Union Bank, Aberfeldy  
1875 Rankin, Patrick, M.D., Willow Bank,  
Airdrie  
1876 Rankine, Alex. M., yr. of Beoch, Loch-  
lands, Maybole  
1874 Rankine John, of Bassendean, 10 Mel-  
ville Street, Edinburgh  
1857 Rankine, John, of Beoch, Lochlands,  
Maybole  
1868 Rankine, R. W., Rosebank, Falkirk  
1859 Rannie, M. G., Edenmouth, Kelso  
1878 Ransome, James Edward (Ransomes,  
Sims, & Head), Ipswich  
1868 Rate, George, Mungoswells, Drem  
1854 Rattray, Major-General J. C., of Craig-  
hall, Blairgowrie  
1874 Rattray, James Clark, M.D., of Cora-  
Bank, Blairgowrie  
1856 Rawdin, Joseph, Chemist, Jedburgh  
1870 Rawline, J. D., Rose Farm, Formby  
Liverpool  
1854 Ray, William, Sunbank, Elgin  
1863 Rea, Charles, Doddington, Wooler  
1878+REAY, Right Hon. Lord, Carolside, Earl-  
ston  
1878 Reay, Thomas, Abbey Town, Carlisle  
1874 Reddie, Captain John Griffiths, of Red-  
house, Rickarton House, Stonehaven  
1857 Redfern, W. Macquarrie, London  
1864 Reekie, A., Walton, Auchtertool, Kirk-  
caldy  
1872 Reekie, Wm., Carterhaugh, Selkirk  
1857 Reid, Alexander, Cruvie, Cupar  
1873 Reid, Alexander, Architect, Elgin  
1880 Reid, Andrew, Haining Valley, Linlith-  
gow  
1844 Reid, Charles G., W.S.  
1876 Reid, Donald, Edradour Distillery, Pit-  
lochry  
1867 Reid, F. R., of Gallowflat, Rutherglen  
1879 Reid, Frank R., jun., Ballid, Kingussie  
1858 Reid, George, 23 Justice Mills Lane,  
Aberdeen  
1874 Reid, George, Baads of Drum, Peterculter,  
Aberdeen  
1876 Reid, George, jun., Clinterty, Blackburn,  
Aberdeen  
1871 Reid, George, of Tillyery, Milnathort  
1880 Reid, G. A., 22 Glover Street, Leith  
1877 Reid, Dr James, Templeton, Mossat  
1855 Reid, James, Sommersfield, Haddington  
1872 Reid, Dr J. B., Aberfeldy  
1857 Reid, J., Corsebank, Sanquhar

## Admitted

- 858 Reid, James, Waterside Cottage, Alford  
876 Reid, James, Horse Bazaar, Peterhead  
875 Reid, James, Kilmundy, Glamis  
867 Reid, James R., of Woodburn, Rutherglen  
875 Reid, James, Inchberry, Inverness  
869 Reid, James, Livingston, Huntly  
1859 Reid, John, Ingie, Leslie  
1870 Reid, John James, Advocate, & Great  
Stuart Street, Edinburgh  
1876 Reid, Peter, Crofts of Glenmuick, Ballater  
1864 Reid, Walter, Craigmahall, Bridge of  
Allan  
1871 Reid, William, Pittentian, Crief  
1871 Reith, James, South Auchincloch, Skene,  
Aberdeen  
1876 Reith, Robert, Middlefield, Woodside,  
Aberdeen  
1878 Rennie, James, Brewer, Dumfries  
1877 Rennie, John, Craigieburn, Falkirk  
1878 Rennie, William, Andrewsford, Fyvie  
1879 Renwick, William, Yoker Mains, Yoker  
1872 Renwick, John, Nurseryman, Melrose  
1859 Reoch, J. F., 39 Inverleith Row, Edin-  
burgh  
1873 Richardson, Alex., 5 Jordan Lane, Edin-  
burgh  
1863 Richardson, D., of Hartfield, Glasgow  
1874 Richardson, George, Western Club, Glas-  
gow  
1861 Richardson, Major James T. Stewart,  
yr. of Pitfour, Perth  
1823 RICHARDSON, Sir John S., of Pitfour,  
Bart., Perth  
1873 Richardson, John, London Road, Carlisle  
1851 Richardson, John, Writer, Haddington  
1863 Richardson, J., Southfield, Haddington  
1878 Richardson, Ralph, W.S., 19 Castle Street,  
Edinburgh  
1837 Richardson, Robert, 16 Bruntsfield Place,  
Edinburgh  
1863 Richardson, R., Crailingnook, Jedburgh  
1878 Richardson, Robert A., Dunask, Locker-  
bie  
1878 Richardson, William, Flosshead, Gt. Gt. Gt.  
1840\* RICHMOND and GORDON, His Grace the  
Duke of, K.G., Gordon Castle, Forcubers  
—President of the Society  
1861 Richmond, G., of Balhallow, Braon  
1861 Richmond, John, Dron, Bridge of Earn  
1871 Richmond, T., Hilton, Perth  
1831 Rickman, Thomas, late Architect, Bir-  
mingham  
1877 Riddell, Andrew, 1 Victoria Street, Edin-  
burgh  
1863 Riddell, David, Blackhall, Paisley  
1880 Riddell, John, Rink, Galashiels  
1854 Riddell, Thomas, Athelstanford, Drem  
1845 RIDDELL, Sir T. M., of Sunart, Bart.,  
Strontian  
1852 Riddell, William Hundalee, Jedburgh  
1863 Riddell, William, Howford, Peebles  
1880 Riddle, Andrew, Yeavinger, Wooler  
1878 Rigg, James Home, of Tarvit, Cupar-Fife  
1861 Rigg, Wm., Banks, Kirkcubright  
1877 Rignall, James, Agricultural Implement  
Agent, Cupar-Fife  
1852 Rintoul, Charles, Kingston, North Bur-  
wick

Admitted

- 1861 Rintoul, D., Mains of Blebo, Cupar-Fife  
 1865 Rintoul, Robert, of Lahill, Largo  
 1869 Ritchie, Charles, S.S.C., 20 Hill Street, Edinburgh  
 1865 Ritchie, Charles, late Ladoga Lodge, Musselburgh  
 1877 Ritchie, David (Kilmux, Kennoway, Fife), 13 Windsor Street, Edinburgh  
 1857 Ritchie, John, Newbigging Mains, Carnwath  
 1867 Ritchie, John, Whitecastle, Biggar  
 1878 Ritchie, John, 11 Morrison Street, Edinburgh  
 1872 Ritchie, Robert, Cloverhill, Biggar  
 1879 Ritchie, Robert Bower, Accountant, Dundee  
 1853 Ritchie, W., Spott, Dunbar  
 1852 Ritchie, Wm., Plean Mill, Stirling  
 1865 Ritchie, W., of Middleton, Gorebridge  
 1841 Robertson, James, Kelso  
 1863 Robertson, John, Falside, Stirling, Kelso  
 1863 Robertson, Robert, Ladyrig, Kelso  
 1873 Roberts James, Greenhead of Arnot, Leslie, Fife  
 1871 Robertson, Mrs. sen., of Struan, Rannoch  
 1876 Robertson, Alex., Tocherford, Rayne, Warthill, Aberdeen  
 1879 Robertson, Alex., Ballechin, Ballinluig  
 1856 Robertson, A. F., Ardlaw, Fraserburgh  
 1869 Robertson, Rev. A. Irvine (of Kin-drochit), Clackmannan  
 1832 Robertson, Andrew, M.D., of Hopewell, Tarland  
 1840 Robertson, Arthur John, Culeabock House, Inverness  
 1860 Robertson, Dr Charles, Auchteruirn, Gairloch  
 1869 Robertson, C., of Kindence, Invergordon  
 1861 Robertson, David, Allan Hill House, Dunblane  
 1847 Robertson, David Souter, of Whitehill, Cookston Park, Brechin  
 1879 Robertson, Donald, Blackhill, Ballinluig  
 1876 Robertson, Duncan, of Pennyghael, 73 Great King Street, Edinburgh  
 1864 Robertson, D. G., of Torrie, Callander  
 1880 Robertson, Edgar W., of Auchleeks, Perthshire  
 1876 Robertson, George, of Hadderwick, C.F., 47 Albany Street, Edinburgh  
 1860 Robertson, George B., 1 Windsor Street, Edinburgh  
 1836 Robertson, James, 27 Albert Place, Stirling  
 1881 Robertson, James, Blackhaugh, Dunkeld  
 1859 Robertson, J., Donbrass, Cupar-Fife  
 1880 Robertson, Major James, United Service Club, Edinburgh  
 1870 Robertson, James A. (late Chapel Park, Kingussie), Virginia, U.S.  
 1876 Robertson, Major James C., Whitefield, Govan  
 1873 Robertson, James F., New Mains, North Berwick  
 1851 Robertson, James Stewart, W.S., of Eldradynato, Ballinluig  
 187 Robertson, James Stewart, yr. of Eldradynato, Ballinluig

Admitted

- 1876 Robertson, John, Auchnahyle, Pitlochry  
 1874 Robertson, John, of Grishernish, Portree  
 1855 Robertson, John, Mount Abundance, Queensland  
 1854 Robertson, J., Glencrispisdale, Strontian  
 1870 Robertson, John, West Mitchellton, Lochwinnoch  
 1878 Robertson, John, of Golden Grove, South Australia  
 1864 Robertson, J., Old Blair, Blair-Athole  
 1867 Robertson, J., Bellinty, Glenisla, Alyth  
 1874 Robertson, John, of Rhyndie, Fearn  
 1856 Robertson, John, 68 Bath Street, Glasgow  
 1873 Robertson, John S., Belmont Estate Office, Meigle  
 1857 Robertson, Neil, Auchtomore, Lochearnhead  
 1872 Robertson, Peter, Achilty, Dingwall  
 1872 Robertson, Peter, Coleraine, Ireland  
 1870 Robertson, Peter D., 9 King Street, Finsbury Square, London, S. O.  
 1847 Robertson, General Richardson, of Tullybelton, C.B., Bankfoot  
 1872 Robertson, Robt., West Barns, Dunbar  
 1876 Robertson, Robert Wm., of Glenshillish, Rockingham, Kilreggan  
 1861 Robertson, Stewart Souter, yr. of Whitehill, Carnwath  
 1859 Robertson, W. M., of Gartloch, Huntington Cottage, Bridge of Allan  
 1874 Robertson, Wm., Aberlour Mains, Craigellachie  
 1857 Robertson, Wm., Cuttlebrae, Fochabers  
 1863 Robertson, William, V.S., London  
 1879 Robertson, Wm., jun., Two-mile House, Murrayshall, Perth  
 1879 Robertson, Wm., Engineer, Princes Street, Perth  
 1870 Robertson, Wm. A., Abbotshill, Forres  
 1872 Robeson, Geo., Brotherton, Kelso  
 1851 Robinow, Adolph, 21 Clarendon Crescent, Edinburgh  
 1871 Robinson, Robert, Manor Farm, Claverdon, Warwick  
 1878 Robinson, Thos., Cargo, Carlisle  
 1863 Robson, Chas., Lamlaw, Kelso  
 1874 Robson, John, Newton Bellingham, Northumberland  
 1851 Rodger, David, Penkiln, Carlisleston  
 1859 Rodger, Peter, Selkirk  
 1838 Rodger, R., Hadlow Castle, Tunbridge  
 1865 Rodger, Robert M., Estate Factor and Banker, Royal Bank, Airdrie  
 1873 Rodgie, Henry, late Rothes Estates Office, Leslie, Fife  
 1857 Rodger, Hugh, Hillhead, Kilmarnock  
 1862 Rogers, James S., Rose Mill, Dundee  
 1841 Rogers, Wm., Ph.D., Rose Mill, Dundee  
 1851 Rogerson, G., of Pearseby Hall, Pumphall, Moffat  
 1864 Rogerson, James, of Wamphray, Gillesbie, Lockerbie  
 1837 Rolland, Adam, of Gask, 20 Athole Crescent, Edinburgh  
 1857 Rollo, Right Hon. Lord, Duncrub House, Dunning

## Admitted

- 1863 Romanes, Robert, of Harryburn, Lauder  
 1873 Rome, Thomas, Northampton Downs,  
 Barcoo River, Queensland—*Free Life*  
*Member*  
 1857 Ronaldson, Alex., Glasgow  
 1869 Morrison, John, Dumfries  
 1879 Roscoe, Wm., C., Newton House, Chester  
 1869 Rose, Hugh, Solicitor, Inverness  
 1875 Rose, Rev. Hugh Francis, of Holme Rose,  
 Fort-George Station  
 1865 Rose, James, Mains of Connage, Fort-  
 George Station  
 1865 Rose, John, Leanach, Inverness  
 1865 Rose, Major James, of Kilravock, Nairn  
 1854 Rose, Wm., Sheriffston, Elgin  
 1863+ROSEBERRY, Right Hon. the Earl of, Dal-  
 meny Park, Edinburgh  
 1875 Ross, Alexander, Oldtown, Tarland  
 1880 Ross, Alex., 66 Queen Street, Edinburgh  
 1864 Ross, David, Banker, Dingwall  
 1880 Ross, D. A. MacBean, Banker, Tain  
 1864 Ross, D. G., Merchant, Dingwall  
 1874 Ross, Duncan, Hilton, Inverness  
 1872 Ross, George, Merchant, Dingwall  
 1839 Ross, George, of Pitcairie, Parkhill  
 1865 Ross, G., Eraelagwell, Invergordon  
 1849 Ross, Lieut.-Col. George W. H., of Cro-  
 marty  
 1858 Ross, H., jun., Union Bank of Scot-  
 land, Tarland  
 1877 Ross, James, Baldow, Lennoxton  
 1876 Ross, James, Balblair, Edderton  
 1870 Ross, James, M.D., Linksfield, Elgin  
 1863 Ross, James, Newtonlees, Kelso  
 1871 Ross, James, E., Factor, Abercainry,  
 Crieff  
 1870 Ross, John, The Grove, Ravensglass, Carn-  
 forth  
 1874 Ross, John, Meikle Tarrel, Fearn  
 1843 Ross, John Leith, of Arnage, Ellon  
 1880 Ross, Major-Gen. Patrick Robertson, of  
 Glenmoidart, New Club, Edinburgh  
 1871 Ross, Peter, Arngrove, Torphins  
 1880 Ross, Richard, Rutherford, Kelso  
 1856 Ross, Thomas, Bachilton, Perth  
 1871 Ross, Wm., Annesley, Torphins  
 1881 Ross, Wm., Drumlegie, Forfar  
 1857+ROSSLYN, Right Hon. the Earl of, Dysart  
 House, Kirkcaldy  
 1870 Rough, Robert, Wellford, Broxburn  
 1850 Roughhead, D., 24 Port Street, Edinburgh  
 1878 Routledge, Charles M., Bank Agent, Port  
 William  
 1878 Routledge, James J. F., Oldmill, Port  
 William  
 1870 Routledge, Wm., Elrig, Port William  
 1857 Rowan, J. M., Atlas Works, Glasgow  
 1881 Rowan, P. F. Connal, of Melkewood,  
 Stirling  
 1871 Roxburgh, Robt., Seed Merchant, Kin-  
 ross  
 1863 ROXBURGH, His Grace the Duke of,  
 Floors Castle, Kelso  
 1856 Roy, Alex., Waterton, Inch, Aberdeen  
 1871 Roy, Fred. Lewis, of Nenthorn, Kelso  
 1871 Roy, Thos., Ballendrick, Bridge of Earn  
 1866 Royd, Robt. Whyt, late Balgudlie, Kirk-  
 caldy

## Admitted

- 1846 Russell, Alex. James, C.S., 9 Shandwick  
 Place, Edinburgh  
 1854 Russell, Andrew Walker, of Kenlygreen,  
 St Andrews  
 1867 Russell, A., Wishaw House, Park-  
 shire  
 1854 Russell, Arthur, Royal Bank, Cupar-  
 shire  
 1859 Russell, David, Silverburn, Leven  
 1835 Russell, Francis Whitworth, late Bengal  
 Civil Service  
 1877 Russell, George, Carnwath  
 1851 Russell, James M., Greenlykes, Tranter  
 1875 Russell, James, National Bank, Airdrie  
 1869 Russell, James, Parbroath, Cupar-Fife  
 1862 Russell, John, late Saughton Hall Mains,  
 Murrayfield  
 1881 Russell, Thomas Purves, of Warroch,  
 Milnathort  
 1853 RUSSELL, Sir William, of Charlton, Bart.,  
 Gloucester  
 1858 Rust, James, Paddocklaw, Banff  
 1872 Rutherford, Andrew, Rumbleton Law,  
 Gordon  
 1860 Rutherford, George, Monteth's Houses,  
 Gorebridge  
 1863 Rutherford, G., Pritonnan, Coldstream  
 1874 Rutherford, Dr James, Woodilee Asylum,  
 Lenzie  
 1861 Rutherford, John, Cromwell Park House,  
 Perth  
 1863 Rutherford, William A. Oliver, of Edger-  
 ston, Jedburgh  
 1854 Ruxton, Andrew, South Artrochie, Ellon  
 1870 Ryrie, Robert, 34 Park Street, Grosvenor  
 Square, London  
 1880 Sadler, John, Royal Botanic Garden,  
 Edinburgh  
 1880 St Clair, J. Sutherland, 99 High Street,  
 Musselburgh  
 1856 Salmon, J., The Linn, Johnstone  
 1871 Salmon, David S. (late Mains of Errol,  
 Errol), Glasgow  
 1858 Salmon, James, Cairnie, Arbroath  
 1868 Salmon, R., Nether Balfour, Durris  
 1854 SALTOUN, Right Hon. Lord, Philorth  
 House, Fraserburgh  
 1875 Sandeman, Alex. B., Huntingtowerfield,  
 Perth  
 1875 Sanderson, James, Dykefoot, Carnwath  
 1864 Sanderson, William, Constopphine Bank,  
 Constopphine  
 1855 SANDILANDS, Hon. James, 31 Prince's  
 Gate, London  
 1876 Sandison, Alex., Uyasound, Unst  
 1873 Sands, James, Milton, Burn of Cambus,  
 Stirling  
 1870 Saunders, R. B., Hutton Grange, Gis-  
 borough, Yorkshire  
 1851 Scobie, John, Lochinver, Lairg  
 1875 Scobie, Neil F., of Hawkhill, Inverness  
 1854 Secon, Kenneth, 46 Rankellor Street,  
 Edinburgh  
 1850 Scott, Alex., Beanston, Haddington  
 1860 Scott, A., Hillside House, Lockerbie  
 1876 Scott, Alexander, Towie Barclay, Aber-  
 deen

Admitted

- 1875 Scott, Alex., Oauldecoats, Liberton  
 1880 Scott, Alexander, 24 Mearns Street, Greenock  
 1848 Scott, Andrew, Glendouglas, Jedburgh  
 1874 Scott, Andrew T. S., of Crosswoodhill, 1 Hill Street, Edinburgh  
 1864 Scott, Right Hon. Lord Charles, Dalkeith  
 1857 Scott, C., Newtonloes, Dunbar  
 1880 Scott, Charles, Bradystone, Murthly  
 1849 Scott, D., Meadowfield, Duddingston, Edinburgh  
 1873 Scott, David Francis, Meadowfield, Duddingston, Edinburgh  
 1866 Scott, D. G. C. (late Parks of Inches, Inverness), Forfarshire  
 1880 Scott, Ebenezer Erskine, C.A., 27 Chester Street, Edinburgh  
 1877 Scott, Lieut.-Col. Francis Cunningham, of Malleny, C.B.  
 1863 Scott, George, Moastower, Kelso  
 1861 Scott, Gideon James (late Hyndhope, Selkirk), New Zealand  
 1861 Scott, Right Hon. Lord Henry, M.P., 3 Tilney Street, Park Lane, London  
 1869 Scott, Hercules, of Brotherton, Bervie  
 1868 Scott, James, Boglon, Torrance of Campsie  
 1850 Scott, James, 1 Woodside Place, Glasgow  
 1862 Scott, James, of Easter Tulloch, Stonehaven  
 1878 Scott, James, Distiller, Garrison Tower, Wishaw  
 1880 Scott, James, 5 Grassmarket, Edinburgh  
 1880 Scott, James Addison, of Wooden, Kelso  
 1876 Scott, James Bruce, Wester Rora, Longside  
 1870 Scott, Maj.-Gen. James C., United Service Club, Edinburgh  
 1873 Scott, James G., Hill of Ruthven, Perth  
 1863 Scott, Dr James Robson (of Ashtrees, Yetholm), Belford  
 1828 Scott, J., Finnart House, Greenock  
 1870 Scott, John, Clebrig, Lairg  
 1874 Scott, John, Noss, Wick  
 1879 Scott, John, Blackhill, Ballinluig  
 1880 Scott, John, of Gala, Galashiels  
 1877 Scott, John Lindsay, of Mollance, Castle Douglas  
 1863 Scott, John Scott Elliot, Buckholm, Galashiels  
 1868 Scott, John, Springfield House, Uddingston  
 1868 Scott, Malcolm, Balmuilly, Bishopbriggs  
 1872 Scott, Peter, Chirnside Crofts, Chirnside  
 1841 Scott, Captain Robert, late H.E.I.C.S.  
 1872 Scott, Ralph Erskine, C.A., 35 Melville St., Edinburgh  
 1863 Scott, Robert, Kinninghall, Hawick  
 1874 Scott, Robert, Easter Mauben, Elgin  
 1873 Scott, Robert, Yokieshill, Mintlaw  
 1873 Scott, Robt. A., Dormont Grange, Lockertie  
 1875 Scott, Robt. Sinclair, Craigievar, Wemyss Bay

Admitted

- 1876 Scott, Thos., Iron Merchant, 51 Grassmarket, Edinburgh  
 1863 Scott, T., of Mersington, Whitton, Kelso  
 1860 Scott, T. Robson, of Newton, Jedburgh  
 1861 Scott, Right Hon. Lord Walter, Dalkeith  
 1850 Scott, Walter, Glendronach, Huntly  
 1878 Scott, Walter, of Broomlands, Dumfries  
 1863 Scott, W., Mervinslaw, Jedburgh  
 1857 Scott, William, Spylaw, Kelso  
 1855 Scott, William, Wester Rora, Mintlaw  
 1875 Scott, William, Condorrat, Airlrie  
 1863 Scott, Wm., Howford, Ettrick, Selkirk  
 1857 Scott, William, Urquhart Road, Old Meldrum  
 1868 Scott, Wm., late Couronsyth, Arbroath  
 1863 Scott, Sir William of, Auerum, Bart., Jedburgh  
 1872 Sconlar, John, Crook, Stirling  
 1875 Seatter, Wm., Saviskail, Rousay, Orkney  
 1872 Selby, B. P., Paston, Coldstream  
 1872 Selby, Robert, Hassendean Bank, Denholm, Hawick  
 1863 Selby, Ephraim, Hassendean Bank, Hawick  
 1830+SELKIRK, Right Hon. the Earl of, St Mary's Isle, Kirkcubright  
 1849 Sellar, P. Pendarleith, Hartfield, Train  
 1868 Sellar, R., Implement Maker, Huntly  
 1868 Semple, John, Haughs of Kinmaird, Brechin  
 1857 Semple, Thomas, Carradale, Campbeltown  
 1877 Semple, William, Mouswald Bank, Dumfries  
 1848 Seton, George, Advocate, 42 Greenhill Gardens, Edinburgh  
 1859 Seton, Henry, V.S., Tolercross, Edinburgh  
 1873 Shairp, Wm., Airth, Stirling  
 1863 SHAND, Hon. Lord, New Hailes, Musselburgh  
 1868 Shand, Geo., Ordens, Boyndie, Banff  
 1870 Shand, John, M.D., 66 Northumberland Street, Edinburgh  
 1864 Shand, William, New York  
 1844 Sharp, James, Helensburgh  
 1873 Sharp, John Johnstone, Lenston, Upper Keith—Free Life Murderer  
 1871 Sharp, Peter, Barhill, Blackford  
 1871 Sharp, Thos., Clathymore, Auchtermurder  
 1836 Shaw, Chas., W.S., Spanish, Leuchmaddy  
 1872 Shaw, Chas. G., Ayr  
 1850 Shaw, Harry, Bogforn, Tarland  
 1863 Shaw, James, Skathmuir, Coldstream  
 1868 Shaw, James, Tillychening, Lamphannan  
 1857 Shennan, James, Balig, Kirkcubright  
 1865 Shephard, George, Shethim, Tarves  
 1875 Sherriff, J., jun., late Queen's Hotel, Glasgow  
 1864 Sheriff, John Bell, Carrouvale, Larbert  
 1872 Shiel, Andrew, Implement Dealer, Coldstream  
 1880 Shield, Walter, Nether Fale, Eddlestone  
 1877 Shields, James, Byers, Bathgate  
 1871 Shields, John, Wallace Works, Perth  
 1868 Shields, George (late Balgove, St Andrews), Manitoba  
 1847 Shirriff, David, Muirton, Drem  
 1850 Shirriff, Samuel D., Saltcoats, Drem

## Admitted

- 1864 Shortreed, R., Attonburn, Yetholm  
 1877 Sidey, James, Gourdie, Dunkeld  
 1873 Slievewright, William, Solicitor, Lerwick  
 1866 Sim, Alex., late Fawella, Inverurie  
 1870 Sim, Henry, Cattle Salesman, Inverness  
 1875 Sim, John Fraser, Oban  
 1879 Sim, Peter, Mains of Powfowll, Falkirk  
 1858 Sim, William, 4 St Bernard's Crescent, Edinburgh  
 1879 Sime, Alex., Dumbarnie, Largo, Fife  
 1830 Simpson, Alex. Horatio, late Hayes, Uxbridge  
 1860 Simpson, Alex., Smeaton, Dalkeith  
 1879 Simpson, Alex., Inverness  
 1853 Simpson, George, Bedrule, Jedburgh  
 1863 Simpson, George, South Burriedales, Alva, Banff  
 1869 Simpson, George, 2 Lauder Road, Edinburgh  
 1851 Simpson, James, Mawcarse, Milnathort  
 1878 Simpson, James, of North Lethams, Kinross  
 1878 Simpson, James, Tower, Alloa  
 1875 Simpson, John, South Colmac, Rothesay  
 1876 Simpson, John (Auchinachie & Simpson), Keith  
 1880 Simpson, John, 6 Greenmount Villas, Burntisland  
 1839 Simpson, Robert, of Cobairdy, Huntly  
 1878 Simpson, Thos., West Byres, Ormiston  
 1874 Simson, C. S., of Threepwood, 7 Nelson Street, Edinburgh  
 1861 Simson, George, Courthill, Kelso  
 1871 Simson, Thos., late Skepie, Cupar  
 1873 SINCLAIR, The Right Hon. Lord, 55 Onslow Square, London, S.W.  
 1859 Sinclair, Arch., late Minard, Inverary  
 1863 Sinclair, David, of North Loirston, Aberdeen  
 1876 Sinclair, James, Cairnbeddie, Balbeggie, Perth  
 1857 SINCLAIR, Sir J. G. T., of Ulbster, Bart., M.P., Thurso Castle, Thurso  
 1875 Sinclair, John, Achintee, Fort-William  
 1869 Sinclair, Peter, Kilmartin  
 1864 SINCLAIR, Sir Robert C., of Stevenson, Bart., Achvarsdale Lodge, Reay, Thurso  
 1872 Sinclair, W. S. Thomson, of Freswick, Dumbeth Castle, Caithness  
 1850 Silverlight, James, The Grove, Torquay  
 1877 Skead, George, Agent, Wislaw  
 1876 Skeen, George, Mill of Gellan, Aboyne  
 1876 Skeen, John, Commercial Inn, Tarnland  
 1831 Skene, Wm. F., W.S., 20 Inverleith Row, Edinburgh  
 1823 Skinner, Captain C. G. Macgregor, late Carlsbrooke House, Isle of Wight  
 1869 Skinner, James, Woodside, Aberdeen  
 1869 Skinner, W., of Corra, W.S., City Clerk, 35 George Square, Edinburgh  
 1874 Skinner, Wm. M., Drumm, Ballindalloch  
 1867 Skirving, Adam, of Croys, Dalbeattie  
 1850 Skirving, Jas., Luffness Mains, Drem  
 1846 Skirving, R. Scot, 29 Drummond Place, Edinburgh  
 1858 Sleigh, John, Land Surveyor, Strichen Mains, Strichen  
 1877 Sligo, Archibald Vincent Smith, of Inzievar and Carmyle, 5 Drummond Place, Edinburgh

## Admitted

- 1863 Slipper, R. R., late 427 New Cross Road, London, S.E.  
 1861 Sloan, D., Coachbuilder, Dumfries  
 1878 Sloan, James, Coachbuilder, Dumfries  
 1870 Sloan, John, Barnhill, Patna, Ayrshire  
 1869 Sloan, Wm., Brieryside, Monkton, Ayr  
 1877 Small, James, Banker, Kirkcaldy  
 1843 Small, David, Writer, Dundee  
 1859 Small, Jas., of Dirnanear, Pitlochry  
 1857 Small, Lindsay, 52 South Street, St Andrews  
 1864 Smart, Jas., Liberton Park, Liberton  
 1858 Smart, John, late Glasgowgo, Blackburn, Aberdeen  
 1880 Smart, John Currie, 54 George Square, Edinburgh  
 1873 Smeaton, Rev. John, of Coul, Tulliallan Manse, Kincardine, Alloa  
 1857 Smith, Adam, Stevenson Mains, Haddington  
 1831 Smith, Adam Davidson, C.A., 29 St Andrew Square, Edinburgh  
 1877 Smith, Alex., Barnford, Dalrymple, Ayr  
 1847 Smith, Alexander, C.E., 28 Market Street, Aberdeen  
 1852 Smith, Alex. (A. & W. Smith & Co.), Westbourne, Govan, Glasgow  
 1863 Smith, Alex., Letham, Berwick  
 1864 Smith, Alex. P., Munloch Farm, Munloch  
 1856 Smith, Andrew, Castle Mains, Douglas  
 1864 Smith, Andrew, Solicitor, Dingwall  
 1868 Smith, Andrew, Castle Mains, Gifford  
 1874 Smith, Archibald Haddow, 1 India Buildings, Edinburgh  
 1853 Smith, Charles, Whittinghame, Prestoukirk  
 1876 Smith, Charles, 36 Howard Street, Glasgow  
 1836 Smith, C. H. Johnstone, late Edinburgh  
 1876 Smith, D. W. E., North Elphinstone, Tranent  
 1878 Smith, Edward, Netherholm, Kirkmahoe  
 1839 Smith, E. B., of Blackwood House, Ecclefechan  
 1864 Smith, F. C., Hoprig, Cockburnspath  
 1862 Smith, George, 20 Lynedoch Street, Glasgow  
 1878 Smith, George G., late of Broomhills, Lochmaben  
 1872 Smith, G. P., Chioceleao, Dunee  
 1857 Smith, Hugh, 9 Kalvininside Terrace (North), Glasgow  
 1855 Smith, James, of Olrig, Thurso  
 1857 Smith, James, Broomhill, Partick  
 1857 Smith, Jas., 24 India Street, Edinburgh  
 1859 Smith, James, 11 Dixon Street, Glasgow  
 1869 Smith, J., Mullochard, Ballindalloch  
 1877 Smith, James, Auculin, Fisherie, Turriff  
 1878 Smith, James, 89 Grassmarket, Edinburgh  
 1879 Smith, James, Senior Magistrate, Kelso  
 1880 Smith, James, Torphin, Colinton  
 1872 Smith, Jas. F., Fireburn Mill, Coldstream  
 1873 Smith, James, Pittengardner, Forloun  
 1878 Smith, James T., Parkend, Lockerslie  
 1851 Smith, John, Advocate, Aberdeen

Admitted

- 1873 Smith, John, Balmain, Fettercairn  
 1874 Smith, John, Cragganmore, Ballindalloch  
 1866 Smith, John, Inverallan House, Grantown  
 1874 Smith, John, Drumduan, Dess, Aberdeen  
 1880 Smith, John, Lenderfoot, Melrose  
 1852 Smith, J. Gordon, Minmore, Ballindalloch  
 1877 Smith, John Guthrie, Mugdock Castle, Milngavie  
 1867 Smith, John Turnbull, C.A., 29 St Andrew Square, Edinburgh—*Auditor of Accounts to the Society*  
 1878 Smith, Melville B., late Broomhills, Lochmaben  
 1872 Smith, Peter, Crooks, Colliestream  
 1864 Smith, Robert, Drontham Park, Stirling  
 1877 Smith, Robert, Dalffhble, Dumfries  
 1872 Smith, Robt. G., Georgeville, Mid-Calder  
 1854 Smith, R. M., 4 Bellevue Crescent, Edinburgh  
 1873 Smith, Thomas, Pembroke, Ontario  
 1877 Smith, Thomas, Powrie, Dundee  
 1880 Smith, Thomas, The Castle, Maybole  
 1878 Smith, Thomas F., Drumfries  
 1854 Smith, Wm., Melkington, Cornhill, Northumberland  
 1856 Smith, Wm., West Drums, Brechin  
 1858 Smith, William, Middleton, Balquharn, Inverurie  
 1860 Smith, William, Banker, Montrose  
 1863 Smith, W., of Dunholm, Stone of Morphie, Montrose  
 1868 Smith, William, New Mains of Urie, Stouchaven  
 1878 Smith, William, Greenhead, Salton, Penciland  
 1878 Smith, William, Corskelly, Lonmay, Aberdeenshire  
 1878 Smith, William, Craigilhu, Glasserton  
 1878 Smith, William, Baitilly, Ceres  
 1873 Smith, Wm. B., Stonelough Villa, Leamington—*Free Life Member*  
 1874 Smithson, Joseph S., General Manager, W. & H. M. Goulding, 25 Eden Quay, Dublin  
 1876 Smythe, David M., yr. of Methven, Perth  
 1846 Smythe, William, of Methven, Perth  
 1867 Smolgrass, Allan, Mollanlu, Cardross  
 1880 Somervail, James A., Hawkeslaw, Colliestream  
 1867 Somervail, P., Glendevon, Winchburgh  
 1867 Somervail, G., of Sorn, Sorn Castle, Manohline  
 1848 Somerville, J., Birch Villa, Peebles  
 1858 Somerville, James, S.S.C., 23 South Blacket Place, Edinburgh  
 1867 Somerville, George Purdie, Muirhouse, Carnwath  
 1850 Somerville, Wm., Merchant, Glasgow  
 1881 Soutar, John, West Hall, Murroes, Dundee  
 1850+Southesk, Right Hon. the Earl of, K.T., Kinnaird Castle, Brechin  
 1877 Spalding, Augustus Frederick Montague, of Holme, New Galloway

Admitted

- 1835 Spears, W. R., Writer, Kirkcaldy  
 1831 Speld, James, Fornech, Blairgowrie  
 1879 Speir, Robert, Blairpark, Largs  
 1879 Speir, R. T. A., Culdees Castle, Muthil  
 1833 Speirs, T. Dundas, late Burnfoot Houston  
 1860 Spence, Adam White, Glencairn House, Crieff  
 1876 Spence, John, Howldswick, Unst  
 1875 Spencer, A., 180 Hope Street, Glasgow  
 1863 Spowart, T., of Broomhead, 7 Coates Crescent, Edinburgh  
 1870 Sproat, Robert, Lennox Plunton, Kirkcudbright  
 1881 Sproat, William, Procurator Fiscal, Tobermory  
 1878 Sproat, William T., Borness, Kirkcudbright  
 1830 Sprot, James, of Spot, Dunbar  
 1830 Sprot, Mark, of Riddell, Lilliesleaf  
 1836 Stables, W. A., Nairn  
 1845+Stair, Right Hon. the Earl of, K.T., Oxenfoord Castle, Dalkeith  
 1880 Stansfeld, Capt. John, Dunmald, Montrose  
 1854 Starforth, John, Architect, 37 York Place, Edinburgh  
 1858 Stark, Andrew, Wester Bogie, Kirkcaldy  
 1875 Stark, Matthew C., Westerton Farm, Doune  
 1862 Stark, Ralph, of Summerford, Camelon, Falkirk  
 1870 Stark, Robert, Kirkcaldy  
 1861 Stark, W. Williamson, Mid-Calder  
 1860 Statter, Thomas, jun., Stand Hall, Whitefield, Manchester  
 1872 Stavert, Archd., of Hoscoate, 18 Royal Terrace, Edinburgh  
 1851 Steadman, James, Boundary Bank, Jedburgh  
 1762 Steadman, J., late Charleston, Dumfriesline  
 1880 Steel, Adam, yr. of Blackpark, Fairmount, Perth  
 1870 Steel, Captain Gavin, of Ballinore, 7 Grosvenor Crescent, Edinburgh  
 1880 Steel, John, Lochwood, Coathridge  
 1878 Steel, Thomas Wilson, Gladenholm, Parkgate, Dumfries  
 1863 Steele, Robert, Greenock  
 1874 Steel, Gourlay, R.S.A., 4 Palmerston Place, Edinburgh—*Animal Portrait Painter to the Society*  
 1854 Steynmann, Conrad, late Merchant, Leith  
 1879 Stein, John, Broomhouse, Dunbar  
 1850 Steinhous, James, South Gyle, Conderophine  
 1861 Steinhous, James, Turnhouse, Cramond Bridge  
 1876 Steinhous, James S., of Northford, Dumfriesline  
 1858 Stephenson, James, Conglass, Inverurie  
 1880 Stephenson, Clement, V.S., Sandyford Villa, Newcastle  
 1879 Stephenson, J. B., Forteviot  
 1874 Stephenson, Richard, Chapel, Dunso  
 1845 Stuart, Andrew, of Auchlunkart, Keith  
 1857 Stuart, D., of Stuart Hall, Stirling, Herongate, Brentwood, Essex

## Admitted

- 1879 Steuart, K. D., Factor, Dupplin, Estate Office, Munday, Aberlathie, Perth  
 1835 STEUART, Sir Henry J. Seton, of Allanton, Bart., Touch, Stirling  
 1876 Steuart, H. J. Gow, Fowler's Park, Hawkhurst, Kent  
 1842 Steuart, James, W.S., 8 Doune Terrace, Edinburgh  
 1864 Steuart, James, junior, Dalkeith Park, Dalkeith  
 1823 Steuart, John, of Dalguise, Dunkeld  
 1880 Steuart, John, of Ballechin, Ballinluig  
 1859 Steuart, Patrick, Middlehill, Moffat  
 1864 Steuart, Captain Robert, of Westwood, West Calder  
 1855 Steuart, Robert, Dundale, Gravesend, Kent  
 1833 Steuart, William, London  
 1839 Stevenson, Alexander, Banker, Langholm  
 1875 Stevenson, Alex. Shannon, of Ach-na-Cloich, Tynemouth, Northumberland  
 1855 Stevenson, Andrew, Gifford Bank, Haddington  
 1853 Stevenson, David, F.R.S.E., Member of the Institution of Civil Engineers, 84 George Street, Edinburgh — *Consulting Engineer to the Society*  
 1853 Stevenson, John B., New Zealand  
 1864 Stevenson, John, Changua, Cumnock  
 1860 Stevenson, Robert, late Banker, Edinburgh  
 1852 Stevenson, Thomas, Mount-Lothian, Penicuik  
 1877 Stevenson, William, Holland, Stronsay, Kirkwall  
 1872 Stevenson, Wm., Lochgrog, Bishopbriggs  
 1860 Stewart, Alexander, Perth  
 1879 Stewart, Rev. Alex. M'Farlane, Corrie-muckloch, Amulree, Dunkeld  
 1871 STEWART, Sir A. Douglas, of Grandtully, Bart., Perth  
 1858 Stewart, Charles, Tighnduin, Killin  
 1842 Stewart, David, London  
 1869 Stewart, David W., of Grange, Lockerbie  
 1870 Stewart, Donald, Chapel Park, Kinrossie  
 1859 Stewart, Donald, Bruar, Blair Athole  
 1831 Stewart, Donald, Little Fardle, Dunkeld  
 1870 Stewart, Duncan, Mosspebble, Ewes, Langholm  
 1877 Stewart, Duncan, Loak, Bankfoot, Perthshire  
 1877 Stewart, Duncan, Bank of Scotland, Callander  
 1863 Stewart, Commander Duncan, R.N., Stronvar, Campbeltown  
 1844 Stewart, G., Kirkchrist, Kirkeudbright  
 1838 Stewart, H. B., of Balmakelilly, Pitlochry  
 1857 Stewart, H. G. Murray, of Broughton, Cally, Gatehouse  
 1871 Stewart, James, Blairfettie, Blair-Athole  
 1876 Stewart, James, Butcher, Coupar-Angus  
 1851 Stewart, J., Pitkelley, St Martin's, Perth  
 1853 Stewart, James, Heathfield, Irvine  
 1857 Stewart, James, Rossland, Bishopton  
 1879 Stewart, James, Chamberlain's Clerk, Braxholme, Hawick

## Admitted

- 1830 Stewart James, W., C.E., 39 York Place, Edinburgh  
 1873 Stewart, John, Bochartie, Callander  
 1854 Stewart, John, Burnside, Strathaven  
 1855 Stewart, John, Upper Ardgascadie Rothsay  
 1852 Stewart, John, Duntulm, Port Arthur  
 1873 Stewart, John, Manager Home Farm, Ballindalloch  
 1879 Stewart, John, Land Steward, Glamis Castle, Glamis  
 1871 Stewart, Captain John C., of Farncliffe, Appin  
 1853 Stewart, John Archd. Shaw, 13 Queen's Gate, London  
 1869 Stewart, Mark John, of Southwick, Ardlow, Wigtownshire  
 1843 STEWART, Sir M. R. Shaw, of Blackhall, Bart., Ardgowan, Greenock  
 1863 Stewart, Neil P., Vaynol, Bangor, North Wales  
 1859 Stewart, Osmond de Haviland, Creamery, Welin, Salop  
 1860 Stewart, Peter, Dornoch Main, Annan  
 1853 Stewart, Robert, of Ingleston, Ruthie  
 1871 Stewart, Major Robert, of Ardvorlich, Lochearnhead  
 1873 Stewart, Robert, Kippencross, Dunblane  
 1846 Stewart, Robt. H. Johnstone, of Physgill, Glasserton, Whitthorn  
 1857 Stewart, Samuel, Sandhole, Fraserburgh  
 1850 Stewart, William, Tonrooch, Campbeltown  
 1857 Stewart, William, 24 Maclean Street, Plantation, Glasgow  
 1860 Stewart, William, Saddler, Aberfeldy  
 1872 Stewart, William, Octofad, Port Charlotte, Islay  
 1878 Stewart, William, of Shambellie, Dumfries  
 1877 Stirling, Andrew, of Muiravonside, Linlithgow  
 1863 STIRLING, Sir C. E. F., of Glorat, Bart., Milton of Campsie  
 1864 Stirling, Captain Gilbert, Royal Horse Guards, London  
 1857 Stirling, Major Graham, of Craigbarnet, Lennoxton  
 1867 Stirling, James, of Garden, Kippen, Stirling  
 1833 Stirling, John, of Kippendavie, Dunblane  
 1865 Stirling, Colonel John S., of Gargunmock, Stirling  
 1879 Stirling, Patrick, yr. of Kippendavie, Dunblane  
 1839 Stirling, T. Graham, of Strowan, Crief  
 1855 Stirling, William, of Tarluff, Linlithgow  
 1867 Stobo, Andrew, Porterstown, Thornhill  
 1880 Stobo, Robert, of Hallidayhill, Anklagirth, Dumfries  
 1855 Stodart, David, Banker, Lanark  
 1875 Stodart, George, Netherorton, Newton Mearns, Renfrewshire  
 1851 Stodart, John, late Cawler Cuilt, Fern, Marchhill

- Admitted  
 1878 Stodart, J. A., Blairmore, Greenock  
 1880 Stodart, Thomas Tweedie, of Oliver, Raehan Mill, Bigger  
 1855 Stodart, William, Wintonhill, Traout  
 1880 Storie, W. G. R., Lanton, Jedburgh  
 1869 Stromeont, Right Hon. Viscount, Seone Palace, Perth  
 1832 Stott, Gibson, 27 Victoria Street, Westminster, London  
 1874 Strachan, Andrew, Saphock, Old Mel-drum  
 1878 Strachan, Charles, Tillyorn, Tarland  
 1876 Strachan, George, Inverurie Mains, Ellon  
 1858 Strachan, James, Wester Fowlis, Alford  
 1858 Strachan, Lewis, Cluny of Raemoir, Ban-chory  
 1867 Strang, J., High Crewburn, Strathaven  
 1847 STRATHALLAN, Right Hon. Viscount  
 1878 Strathern, Robert, W.S., 12 South Char-lotte Street, Edinburgh  
 1867 STRATHMORE, Right Hon. the Earl of, Glamis Castle, Glamis  
 1874 Stratton, David, 18 Middleby Street, Edinburgh  
 1878 Struthers, William, Logan Mains, Canon-bie  
 1863 Stuart, Alexander C., of Eaglescarnie, Inaddington  
 1865 Stuart, Alexander, of Laithers, Turriff  
 1873 Stuart, Charles, Tomindugle, Knockando, Craigellaachie  
 1879 Stuart, Dugald, of Lochcarron, Ross-shire  
 1849+ SUTHERLAND, His Grace the Duke of, K.G., Stafford House, London  
 1876 Sutherland, Alexander, Ramppards, Watten, Golspie—Free Life Member  
 1863 Sutherland, Eric, Linkwood, Elgin  
 1849 Sutherland, George, of Forae, Springfield House, Dalkey, Co. Dublin  
 1871 Sutherland, George, The Peel, Tibbermuir, Perth  
 1865 Sutherland, James B. (of Lanchead, Duncore), S.S.C., 10 Windsor Street, Edinburgh  
 1862 Sutherland, S., Springvale, Sheffield  
 1865 Sutherland-Walker, E. C., of Skibo, Skibo Castle, Sutherland  
 1877 Sutor, James, The Collie, Fochabers  
 1858 Swan, James, Live Stock Agent, 37 Lauriston Place, Edinburgh  
 1869 Swan, James, Inverpelfor, Carnoustie  
 1865 Swan, P. D., Provost of Kirkcaldy  
 1852 Swan, Robert, Writer, Kelso  
 1858 Swan, Thomas, Live Stock Agent, 37 Lauriston Place, Edinburgh  
 1871 Swan, William, Moat Hill, Dundee  
 1861 Swann, James, Collierhall, Douglas  
 1859 Swann, J. R., Dundee, Otago  
 1865 Swanwick, R., Royal Agricultural Col-lege Farm, Cirencester  
 1857 Swinburne, Capt., R.N., of Eilan Shona, Strontian  
 1841 Swinton, Archibald Campbell, of Kim-morhamne, Dunse  
 1880 Swinton, John Laul Campbell, jr. of Kimmerhamne, Dunse
- Admitted  
 1862 Swinton, P. Burn, Holyn Bank, Gifford  
 1853 Sylverff, Thomas Buchan, of Buchlaw, Buchan  
 1874 Syme, David, Manager of the Lawson Seed and Nursery Co., Limited, 1 George IV. Bridge, Edinburgh  
 1859 Syme, George, Milnathort  
 1875 Syme, James, Millbank, Edinburgh  
 1857 Syme, William, Craigie, Leuchars, Fifo  
 1868 Symington, G. C., Kirkcarswell, Kirkeul-bright  
 1 76 Symington, James, Auctioneer, Lanark  
 1848 Symington, T., late Eastside, Penicuik  
 1868 Symington, Gilbert, Glenluce  
 1874 Tait, George, Veterinary Surgeon, Elgin  
 1880 Tait, George, Restonhill, Ayrton  
 1875 Tait, George, jun., V.S., Elgin  
 1879 Tait, Henry, The Prince Consort's Shaw Farm, Windsor  
 1846 Tait, James, Banker, Kelso  
 1872 Tait, James, 34 St Andrew Square, Edin-burgh  
 1876 Tait, John, Crichtie, Inverurie  
 1880 Tait, Joseph, Kirknewton, Wooler  
 1863 Tait, William, Venehuon, Kelso  
 1862 Tait, William Reid, Mina Villa, Thurso  
 1878 Talbert, Peter, Glenelicht, Blairgowrie  
 1862 Tawse, John, W.S., 11 Royal Terrace, Edinburgh  
 1859 Tawse, John Wardrope, W.S., 49 Queen Street, Edinburgh  
 1858 Taylor, W. J., of Glenbarry, Rothiemay House, Huntly  
 1877 Taylor, Edward, of Daliskairth, Dumfries  
 1863 Taylor, Alexander, Hillhouse, Lauder  
 1858 Taylor, Geo., of Kirktonhill, Montrose  
 1876 Taylor, Hugh, Kanishill, Hurlford, Kil-marnock  
 1873 Taylor, James, Land Steward, Buchanan, Drymen  
 1876 Taylor, James, Toux, Mintlaw  
 1858 Taylor, John B., Seton West Mains, Pres-tonpans  
 1861 Taylor, John, Redcastle, Arbroath  
 1870 Taylor, Joseph, Potholm, Langholm  
 1853 Taylor, M., Letter Farm, Cove, Greenock  
 1857 Taylor, R., late Laggan, Campbeltown  
 1857 Taylor, Robert, Dumfriess, Banchoy  
 1877 Taylor, Robert, Solicitor, Secretary Stir-lingshire Agricultural Society, Stirling  
 1872 Taylor, Thomas, Seed Merchant, Dal-keith  
 1880 Taylor, William, Park Mains, Inchinnan, Paisley  
 1857 Templeton, Robert, Ramnahan, Campbel-town  
 1853 Tennant, C., of the Glen, M.P., Innerlel-then  
 1872 Tennant, T., of Priestgill, Strathaven  
 1876 Tennant, Thomas, Walston, Penicuik  
 1876 Tennant, William John, late Gallin Cot-tage, Aberfeldy  
 1873 Terris, James, jun., Dullmuir, Blair Adam  
 1881 Thain, David, Ladywell, Kirriemuir  
 1879 Thien, Albert M., Windsor Hotel, Prince's Street, Edinburgh



## Admitted

- 1877 Thom, Alex., Chapelhill, Peebles  
 1871 Thom, James, Leiden, Urquhart, Strath-  
 miglo  
 1858 Thom, James C., Quithelhead, Durris,  
 Aberdeen  
 1875 Thom, James F., Wellsgreen, East  
 Wemyss, Fifeshire  
 1879 Thom, Robert Dick, Pitlochrie, Gateside,  
 Strathmiglo  
 1871 Thom, William, Demperton, Auchter-  
 mucky  
 1855 Thomas, James, Forthar, Kettle, Lady-  
 bank  
 1872 Thomas, William, of Pinnacle, Ancrum,  
 Jedburgh  
 1871 Thompson, Alexander, Barwell, Port  
 William  
 1878 Thompson, Alexander, Ironmonger, Dum-  
 fries  
 1845 Thompson, Andrew, Berwick-on-Tweed  
 1878 Thompson, George, of Pitmedden, Dyce,  
 Aberdeen  
 1867 Thompson, Henry, of High Green, Rams-  
 hope, Otterburn  
 1872 Thompson, John, Ballieknowe, Kelso  
 1874 Thoms, Geo. Hunter, yr. of Aberlemno,  
 Advocate, Sheriff of Caithness, Orkney,  
 and Shetland, 52 Great King Street,  
 Edinburgh  
 1861 Thoms, Patrick Hunter, of Aberlemno,  
 Dundee  
 1867 Thomson, A., of Mainhill, St Boswell's  
 1873 Thomson, Alex., The Lee, Innerleithen  
 1878 Thomson, Alex. M., Secretary Angus  
 Agricultural Society, Arbroath  
 1880 Thomson, Andrew, 15 Inverleith Place  
 Edinburgh  
 1867 Thomson, Charles W., C.A., 16 Lennox  
 Street, Edinburgh  
 1869 Thomson, Duncan M. (late Stirling)  
 Chicago  
 1854 Thomson, George, Edinburgh  
 1863 Thomson, George, Hopton, Ancrum, Jed-  
 burgh  
 1855 Thomson, James, Mungoswalls, Dunse  
 1858 Thomson, James, Land Valuator, 7,  
 George Street, Edinburgh  
 1868 Thomson, Jas., Newscat of Drumbreck  
 Udy  
 1879 Thomson, James, Coach Works, Stirling  
 1869 Thomson, John, Laggan, Gatehouse  
 1877 Thomson, John, Carronfats, Grange  
 mouth  
 1869 Thomson, John, 49 Hope Street, Glasgow  
 1875 Thomson, John, Prospect Bank, Cath-  
 cart  
 1877 Thomson, Rev. John, of Rosalee, Hawick  
 1880 Thomson, John, The Avenue, Berwick-  
 on-Tweed  
 1848 Thomson, John Anstruther, of Charleston,  
 Colinsburgh  
 1867 Thomson, John Comrie, Sheriff-Substitut  
 of Aberdeen and Kincardine, Aberdeen  
 1874 Thomson, J. Grant, Wood Manager,  
 Grantown, Strathspey  
 1869 Thomson, J. S., M'Cheynston, Dumfries  
 1870 Thomson, Lockhart, S.S.C., 114 Georg  
 Street, Edinburgh

## Admitted

- 873 Thomson, Mitchell, 12 Queen Street,  
 Edinburgh  
 859 Thomson, Peter, Coweoch, Abergeldie,  
 North Wales  
 880 Thomson, Peter, Naidsmann, Alnwick  
 874 Thomson, Robert, Burnbank, Blair-Hum-  
 mond  
 878 Thomson, Robert, of Brac, Lathbruton,  
 Dumfries  
 875 Thomson, Thomas, Bankhead, Alloa  
 850 Thomson, Thomas, Merchant, Glasgow  
 854 Thomson, W., 5 Torphichen Street, Edin-  
 burgh  
 1871 Thomson, William, Coachbuilder, Perth  
 1878 Thomson, William J. F., Gunnaker,  
 Edinburgh  
 1878 Thomson, William, Nyaad, Stirling  
 1875 Thomson, Wm., Aberdeen Town and  
 County Bank, Tairland  
 1878 Thomson, William, M'Murdieston, Duns-  
 core, Dumfries  
 1872 Thomson, W. A., Oil Cake Mills, Leth  
 1875 Thomson, William G., 49 Commerce  
 Street, Glasgow  
 1841 Thomson, William Thomas, 3 George  
 Street, Edinburgh  
 1859 Thorburn, David, Calgary, Tobermory  
 1877 Thorburn, Robert, Stonehill, Lanark  
 1869 Thornton, James, Hornaud, West  
 Calder  
 1872 Thornton, Thomas, Crofthead, Fauldhouse  
 1824 THRIEPLAND, Sir P. M., of Fingask,  
 Bart., Errol  
 1872 Thyne, John, 21 Danube Street, Edin-  
 burgh  
 1859 Thyne, William, 4 Spring Gardens, Stock-  
 bridge, Edinburgh  
 1844 Timins, William, late of Hillfield, Stan-  
 more, Middlesex  
 1869 Tinning, John, Chillosford Lodge, Surl-  
 bourne Hall, Wickham Market, Suffolk  
 1859 Tod, Alexander, Atkenclovi, Lasswade  
 1872 Tod, George, Cairneyhill, Dunfermline  
 1870 Tod, James, Glenkill, Lamash  
 1877 Tod, James, Easter Cash, Strathmiglo  
 1869 Tod, James, Carstairs, Gorgie Mains,  
 Edinburgh  
 1870 Tod, John W., W.S., 63 Queen Street,  
 Edinburgh  
 1870 Tod, Thor. M., West Brackley, Kinross  
 1851 Tod, William, Gospetry, Milnathort  
 1864 Tod, William, Glenree, Lamash, Arran  
 1878 Todd, Alexander, Mouswald Grange,  
 Dumfries  
 1876 Todd, David, 18 St Patrick Square, Edin-  
 burgh  
 1876 Todd, Gavin J., Kinellar Lodge, Aber-  
 deen  
 1858 Todd, James, Gillespie, Glenluce  
 1855 Todd, James, Manitoba, Canada  
 1869 Todd, William, Auchness, Ardwell  
 1878 Todd, William, Balsier, Sorbie, Gar-  
 lleston  
 1865 Tolmie, Alex., Ballisparten, Fort George  
 Station  
 1881 Toplis, Robert, Glamis Hotel, Glamis  
 1871 Torrance, Archibald P., Kippidlaw, Dul-  
 keith

- Admitted  
1863 Torrance, George, Sisterpath, Dunse  
1877 Torrance, Thomas A., Burnhouse Villa, Camps, Kirknewton  
1863 Torrance, T., Laws, Clirnside  
1872 Torrance, William, Camps Line Works, Mid-Caldor  
1873 Torry, Adam Ogilvie, Burnside, Forfar—*Free Life Member*  
1877 Tough, James, Mains of Drum, Drumoak, Aberdeen  
1877 Traill, Adam C., Bonnington Road, Leith  
1880 Traill, James Christie, of Rattar, Caithness  
1886 Traill, Thomas, of Holland, Kirkwall  
1880 Trail, R. M., Brough, Westray, Orkney  
1846 Truquair, Ramsay H., Colinton, Slateford  
1857 Trench, Henry, of Cangort Park, Roscrea, Ireland  
1841 Trotter, Charles, of Woodhill, Blairgowrie  
1865 Trotter, Connts, 10 Randolph Crescent, Edinburgh  
1865 Trotter, Lieut.-Colonel H., of Morton Hall, Edinburgh  
1829 Trotter, Robert Knox, of Ballindean  
1875 Trotter, Robert, Gargston, Inverness  
1866 Trotter, T. C., 54 Park Street, Grosvenor Square, London, W.  
1860 Trotter, Lieut.-Colonel H., of the Bush, Edinburgh  
1875 Troup, Alexander, Strathmiglo  
1850 Tulloch, G., 62 Pollock Street, Glasgow  
1878 Tuke, Dr J. Batty, Saughtonhall, Edinburgh  
1873 Tulloch, James, Dalas, Inverkeithing  
1875 Tulloch, John, Midmaids, Duffus, Elgin  
1844 Turnbull, Alexander, Thornton, Coldstream  
1877 Turnbull, Archibald, Eldinhope, Yarrow, Selkirk  
1874 Turnbull, David, W.S., 12 Kelgrave Crescent, Edinburgh  
1878 Turnbull, David, of Brieryarais, Hawick  
1880 Turnbull, George, Luckier Hall, Belford  
1881 Turnbull, George, Baldoukie, Tannadilee, Forfar  
1857 Turnbull, Gregor, Merchant, Glasgow  
1863 Turnbull, James, Lempitlaw, Eastfield, Kelso  
1877 Turnbull, James, St Colum House, Aberdeen, Fife  
1880 Turnbull, James, Fauldschope, Selkirk  
1844 Turnbull, John, of Abbey St Bathams, W.S., 49 George Square, Edinburgh  
1863 Turnbull, John, East Middle, Hawick  
1862 Turnbull, Mark, Melrose Mills, Melrose  
1859 Turnbull, P., Little Pinkerton, Dumbar  
1877 Turnbull, Peter M., Smithston, Rhynie  
1850 Turnbull, S., Bonhill Place, Banton  
1878 Turnbull, Thomas, Castlebank Mills, Dumfries  
1877 Turnbull, Walter, Tynemont, Ormiston  
1863 Turnbull, William J., Graden, Kelso  
1872 Turnbull, William, Goukshill, Gorebridge  
1868 Turnbull, William George, Spittal, Jedburgh
- Admitted  
1875 Turner, Archibald, jun., Drumdrishag, Ardishaig  
1853 Turner, D., Cornelvaive, Sandbank  
1859 Turner, Frederick J., late the Doan, Kilmarnock  
1853 Turner, John, of Turner Hall, Ellon  
1873 Turner, Peter, Queensferry  
1876 Turner, Robert, Auchnarrow, Ballindalloch  
1868 Turner, William, M.B., Professor of Anatomy, University of Edinburgh, 6 Eton Terrace  
1879 TWEEDDALE, Most Noble the Marquis of, Yester, Haddington  
1869 Tweeddale, George W., Ivy Hill, Westminster, Nelson County, Virginia, U.S.  
1859 Tweedie, Alexander, Coats, Haddington  
1873 Tweedie, Alexander Gladstone, Glespin, Douglas, Lanarkshire  
1860 Tweedie, James, of Quarter, Raeban House, Biggar  
1875 Tweedie, James, Deuchrie, Prestonkirk  
1871 Tweedie, Richard, The Forest, Catterick  
1878 Twaityman, John Marthwaite, Blennerhasset, Aspatria, Carlisle  
1863 Tytler, James Stuart, of Woodhouselee, W.S., 36 Melville Street, Edinburgh  
1873 Udny, John Henry Fullarton, of Udny and Dulwick, Udny, Aberdeen  
1877 Underwood, Peter, Ardnacross, Aros, Mull  
1877 Unite, John, 291 Edgware Road, London, W.  
1864 Urquhart, B. C., of Meldrum, Old Meldrum  
1876 Urquhart, F. Pollard, of Craigston, Turiff  
1858 Urquhart, J. G., of Vellore, Linlithgow  
1875 Ure, George, Wheatlands, Denny  
1875 Ure, George R., Hope Park, Bonnybridge  
1873 Ure, John, Abbey Mains, Haddington  
1874 Ure, William, Boston, Tairbert  
1864 Ure, William, 67 Wallace Street, Stirling  
1853 Usher, John, Stodrig, Kelso  
1872 Usher, J., jun., Gatehousecote, Hawick  
1872 Usher, Thomas, jun., Courthill, Hawick  
1876 Vallentine, George, Arnhall, Brechin  
1858 Vallentine, J., Nether Aillock, Duncecht  
1877 VANE, Sir Henry Ralph, of Hutten in the Forest, Bart., Penrith  
1860 Vassal, Lieut.-Genl. R., London  
1878 Veitch, Andrew, Girthon Kirk, Gatehouse-on-Fleet  
1864 Veitch, Chris., 24 Queen Street, Edinburgh  
1857 Veitch, Walter, Grange, Kinghorn  
1856 Vero, C. E. Hope, late Leclard, Aberfoyle  
1837 VERNON, Hon. Groville R., Auchans House, Kilmarnock  
1873 Villars, Frederick Ernest, Closeburn Hall, Thornhill  
1880 Waddell, Alexander, of Palace, Jedburgh  
1874 Waddell, A. Peddie, 4 Great Stuart Street, Edinburgh  
1874 Waddell, James, Airdrie, New Monkland

Admitted	Admitted
1872 Waddell, John, of Easter Inch, 34 St Andrew Square, Edinburgh	1875 Wallace, Robert, Auchendrain, Manchain
1869 Waddell, John, Southrigg, Bathgate	1854 Wallace, Robert A., Rhynd, Dunfermline
1869 Waddell, William, Netherton, Whitburn	1870 Wallace, R., Langhams, Kirkcubright
1857 Wakefield, J. Collen, late Eastwood, Thornliebank	1878 Wallace, Robert, Twigle, Lockerbie <i>Free Life Member</i>
1857 Wakelin, John, Oil Mills, Musselburgh	1879 Wallace, R., Foundry, Castle Douglas
1877 Walcot John (G. M'Callum & Co.), 13 Greenside Place, Edinburgh	1880 Wallace, Thomas Alex., Banker, Burntisland
1880 Waddie-Griffith, Sir George, of Hendersyde Park, Bart., Kelso	1879 Wallace, William (John Wallace & Sons), Graham Square, Glasgow
1878 Walker, Alexander, of Findyate, Ballinluing	1875 Wallace, William, Kinnear, Kilmany, Cupar-Fife
1870 Walker, Alexander, Stagebank, Horiot	1871 Wallace, William, of Newton of Collieston, Ladybank
1872 Walker, Alexander John (Bowland), 8 Manor Place, Edinburgh	1877 Walls, James, Lochran, Kilmross
1878 Walker, Archd., Banker, Auchtermuchty	1854 Wallbank, Jonas, Berwick-upon-Tweed
1847 Walker, Charles (late Drumblair), Australia	1872 Walley, Thom., M.R.C.V.S., Principal of the Veterinary College, Edinburgh <i>—Professor of Cattle Pathology to the Society</i>
1861 Walker, Fountaine, of Ness Castle, Inverness	1878 Walls, Robt., Kerse Mills, Stirling
1857 Walker, Francis, Craignetherty, Turriff	1845 WALPOLB, The Hon. Henry, Worterton Park, Aylsham, Norfolk
1881 Walker, George, Factor, South Uist	1873 Walton, George Kent, Long Champton, Shipston-on-Stour, Warwickshire— <i>Free Life Member</i>
1858 Walker, Lieut.-Col. George G., of Crawfordton, Thornhill	1869 Wardrop, W. M., Williamfield, Portobello
1875 Walker, George A., Novar Main, Evanton	1874 Wardrop, Robert, Garlaff, Cumnock
1863 Walker, G. J. (Walker & Beattie, Land Surveyors, Aberdeen), Portlethen, Aberdeen	1852 Warnock, A., Bearyards, Bishopbriggs
1860 Walker, James, of Dalry, 10 Grosvenor Crescent, Edinburgh	1862 Warrack, William, Newmill of Fintray, Aberdeen
1847 Walker, James, of Blairton	1868 Warrand, Captain A. J. C., Ryefield, Ferrintosh, Dingwall
1867 Walker, James, Grassmere, Stonewall, Winnipeg, Manitoba, Canada	1858 WARRENDA, Sir G., of Lochend, Bart., Brunsfield House, Edinburgh
1877 Walker, James, West Side of Bruz, Kildrumny, Aberdeen	1879 Warwick, A., Outer Woodhead, Canonbie
1857 Walker, John, late Eastfield, Springburn	1856 Warwick, W., Glencartholm, Canonbie
1862 Walker, John, 1 Polwarth Terrace, Edinburgh	1871 Waters, George S., Tistormains, Halkirk-road, Caithness
1872 Walker, J. P. S., Veterinary Establishment, Littlegate, Oxford	1837 Waterston, Charles, Nairn
1854 Walker, Robert, Leuchars House, Elgin	1869 Watherston, James, 29 Queensferry Street, Edinburgh
1859 Walker, Robert, Altyre, Forres	1869 Watherston, Wm., 29 Queensferry Street, Edinburgh
1861 Walker, Robert, Muirhall, Perth	1875 Watson, Arthur, 416 Crown Street, Glasgow
1875 Walker, Robert B., Mains of Portlethen, Aberdeen	1855 Watson, Crawford, late The Lion, Tebbury, Worcestershire
1875 Walker, Thomas, Lochton, Incheure	1859 Watson, Douglas (late Thurstar, Wick), New Zealand
1861 Walker, Thomas R., Cupar-Fife	1876 Watson, George, Mendenack, Hartly
1859 Walker, W., South Quarter, Kingsbarns	1848 Watson, George, of Norton, Ratho
1858 Walker, Wm., Ardhuncart, Mossat	1870 Watson, Geo., late Fushiebrae, Gorbidge
1864 Walker, William, Kintrae, Elgin	1875 Watson, Hugh, Cull, Cairndow
1872 Walker, William, Horse Dealer, Stirling	1878 Watson, James Graham, 45 Charlotte Square, Edinburgh
1835 Walker, William S., of Bowland, C.B., 125 George Street, Edinburgh— <i>Treasurer of the Society</i>	1870 Watson, Jas. M., 2 Fingal Place, Edinburgh
1863 Walker, William Campbell, yr. of Bowland	1869 Watson, John Paton, of Blackford, Rothie Norman
1873 Wall, George Y., Durham— <i>Free Life Member</i>	1857 Watson, John, of Farnock, Hamilton
1878 Wallace, Alex., Pitglassie, Dingwall	1864 Watson, John, Culterallars, Biggar
1878 Wallace, Henry Ritchie Cooper, of Busbie and Cloncaird, Ayrshire, 21 Magdala Crescent, Edinburgh	1877 Watson, John, Skipperton, Denny
1861 Wallace, James, Brake, St Andrews	1872 Watson, Patrick, Priarstown House, Tallaught, County Dublin
1861 Wallace, John, late Illeston, Broxburn	
1875 Wallace, John, 30 Oak Street, Glasgow	
1879 Wallace, J., Foundry, Castle Douglas	

# Highland and Agricultural Society, 1881.

## Admitted

- 1852 Watson, Wm. (late The Binna), Beecher  
Wills, Illinois, U.S.  
1841 Watson, William, Seaside, Ferrol  
1880 Watson, William, Ochterlony Mains, Forfar  
1883 Watson, W. S., of Burnhead, Bucklands,  
Hawick  
1873 Watt, Alex., Balbarton, Kirkealdy  
1871 Watt, George, Kilmany, Cupar-Fife  
1868 Watt, Gordon, Mains of Park, Drumoak  
1875 Watt, James, Garbith, Orton, Fochabers  
1878 Watt, James (Little & Ballantyne),  
Knowfield, Carlisle  
1879 Watt, James, Pitlinnie, Cairniehill, Dun-  
fermline  
1880 Watt, John, Drumgray, Airdrie  
1875 Watt, Robert, Solicitor, Airdrie  
1878 Watt, W. G. T., Kierfield House, Strom-  
ness  
1872 Wauchope, Major, of Niddrie Marischall,  
Liberton  
1842 Wauchorn, Sir John Don, of Edmon-  
stone, Burt., Edmonstone House, Liberton  
1871 Waugh, Allan, Avonbridge, Falkirk  
1857 Waugh, J., of St John's Kirk, Biggar  
1875 Waugh, John, jun., Glenormiston, Inner-  
leithen  
1873 Wauch, John, Langshaw, Galashiels  
1875 Waugh, William, V.S., Stirling  
1877 Weatherhead, Wm., Bogangreen, Colding-  
ham  
1863 Webster, J., New Horndean, Berwick  
1870 Webster, Robt., Airds of Kells, New  
Galloway Station  
1863 Weddell, John Wilkie, Lauder Barns,  
Lauder  
1874 Wedderburn, Henry Scrymgeour, of  
Wedderburn, Birkhill, Cupar-Fife  
1881 Wedderspoon, George, Balgavies, Forfar  
1881 Wedderspoon, James, Estate Agent,  
Netherhall, Cumberland  
1881 Wedderspoon, Thomas, Auctioneer,  
Perth  
1877 Weir, James, Sandilands, Lanark  
1864 Weir, Robert, Sandilands Cottage,  
Lanark  
1873 Weir, William, Inches, Larbert  
1868 Weir, William, Portland Iron Works,  
Kilmarnock  
1860 Welsh, Alexander, Edinburgh  
1869 Welsh, Henry, 6 George Street, Edin-  
burgh  
1860 Welsh, John, Kirkton, Hawick  
1881 Welsh, Patrick, Procurator-Fiscal, Stir-  
ling  
1858 Welsh, Thomas, of Earlsbaugh, Ericstane,  
Moffat  
1842 Welwood, Alan A. Maconachie, of  
Garvock, Meadowbank, Kirknewton  
1819 Wemyss and Marsh, Right Hon. The  
Earl of Gosford, Haddington  
1880 Wemyss, David Watson, Newton Bank,  
St Andrews  
1872 Wemyss, R. G. E., of Wemyss, Kirk-  
caldy  
1863 Wharnccliffe, Right Hon. Lord, 15  
Curzon Street, London  
1863 White, A., Kelso Mains, Edrom  
1880 White, E. C., Ayton Law, Ayton

## Admitted

- 1882 White, Francis, M.D., Perth  
1863 White, James, of Overton, Dumbarton  
1876 White, James, Stagehall, Stow  
1863 White, John, of Grougar, 53 Princess' Gate,  
London  
1873 White, John, Ardencaple, Helens-  
burgh  
1872 White, John A., Shiells Mains, Biggar  
1868 White, J. F., Grain Merchant, Aber-  
deen  
1838 White, Peter, Accountant, Glasgow  
1842 White, Robert, W.S., 23 Drummond  
Place, Edinburgh  
1872 White, Robert, Outerston, Gorebridge  
1838 White, William, Merchant, Glasgow  
1854 White, Wm., of Mousebank, Lanark  
1872 White, Wm., Lennel Hill, Coldstream  
1850 Whitton, Geo., Easter Drylaw, Davidson's  
Mains  
1861 Whitton, Andrew, of Couston, Newtyle  
1871 Whyte, Angus, Easdale, Oban  
1870 Whyte, Archibald, late jun., Braidownie,  
Kirkcaldy  
1876 Whyte, Duncan, 326 Duke Street,  
Glasgow  
1876 Whyte, D. C., Ballimore, Lochstriven-  
head, Sandbank  
1865 Whyte, James, Aldbro, Darlington  
1870 Whyte, James A., Kirkmabreck, Stran-  
ner  
1853 Whyte, John, Ballochyle, Sandbank  
1871 Whyte, John, West Dunoon, Maigle  
1875 Whyte, John, Lundin Mill, Largo  
1860 Whyte, Rev. R., Dryfesdale, Lockersbie  
1868 Whyte, William, Spott, Kirkcaldy  
1870 Wight, Alex., Ironmonger, Forres  
1865 Wight, George, 14 Duke Street, Edin-  
burgh  
1872 Wight, R. B., late Wester Melville,  
Lasswade  
1878 Wight, Thomas, Pilmuir, Lauder  
1873 Wightman, James C. Seton, of Hol-  
house, 7 Darnaway Street, Edinburgh  
1869 Wightman, John Seton, of Courance, 7  
Darnaway Street, Edinburgh  
1873 Wilkin, George, Waterside of Forbes,  
Alford  
1843 Wilkie, D., of Auchlishie, Kirkcaldy  
1879 Wilkie, David, Castle Campbell Hotel,  
Dunfermline  
1857 Wilkie, George, Cowdenlaws, Dysart  
1881 Wilkie, James, Solicitor, Kirkcaldy  
1830 Wilkie, John, of Foulden, Berwick  
1879 Wilkin, Robert, Christ's Church, New  
Zealand  
1862 Wilkin, T., Tinwald Downs, Dum-  
fries  
1873 Will, Robert W., S.S.C., 37 Queen Street,  
Edinburgh  
1872 Willacy, Robert, Penwortham Priory,  
Preston  
1877 Williams, John, Phoenix Works, Rhuddlan,  
Rhyll  
1878 Williams, Robert, The Green, Wishaw  
1867 Williams, W., Principal of the New  
Veterinary College, Edinburgh—*Pro-  
fessor of Veterinary Surgery to the  
Society*

Admitted	Admitted
1878 Williamson, Miss Katharine Isabella, of Cardrona, Peebles	1857 Wilson, John, Overhouse, Strathaven
1879 Williamson, Alex., Sypland, Kirkcudbright	1859 Wilson, John, of Auchlineck, Killearn
1858 Williamson, Andrew F., Standingstones, Dyce, Aberdeen	1878 Wilson, John, of Alderston, Mid-Caldor
1870 Williamson, Benjamin, Canal Iron Works, Kendal	1878 Wilson, John, West French, Stranraer
1861 Williamson, David Robertson, of Lawers, Crieff	1879 Wilson, John, jun., Fairfield, Lorton, Cockermonth— <i>Free Life Member</i>
1871 Williamson, Douglas G., Bombie, Kirkcudbright	1879 Wilson, John J., Clydesdale Bank, Penicuik
1850 Williamson, George, Shempston, Elgin	1859 Wilson, J. F., Darnhall Mains, Biddlestone
1878 Williamson, James, Upper Senwick, Kirkcudbright	1862 Wilson, J., Chapelhill, Cockburnspath
1878 Williamson, James, Greenhead, Wishaw	1833 Wilson, J. P., of Polquharn, Sheriff of Ross, Cromarty, and Sutherland, 6 Dundas Street, Edinburgh
1875 Williamson, Robert, Netherwood, Banff	1865 Wilson, Peter, Linsalg, Tigh-na-brnialach
1871 Williamson, Thomas, Merchant, Kirkcudbright	1870 Wilson, Peter, Noblohall, Lamancha
1854 Willis, Thomas, Manor House, Carperby, Bedale	1880 Wilson, Peter, Seed Crusher, Burntisland
1868 Willison, Duncan Campbell, Dalpeddar, Sanquhar	1878 Wilson, Peter M'C., Nether Cribton, Dumfries
1873 Willison, Geo., Parish Holm, Douglas	1857 Wilson, Philip, Corn Factor, Dunso
1857 Willison, Jas. P., of Culzean, Maxwellton, Maybole	1868 Wilson, Richard, C.A., 28 Great King Street, Edinburgh
1858 Willison, John, Parish Holm, Douglas	1852 Wilson, Robert, Abbey View, Bridge of Allan
1868 Willison, J., jun., Acharn, Killin	1863 Wilson, Robert, Manswries, Killardran
1842 Wilson, Alex., Inchgower, Buckie	1857 Wilson, Thomas, late Auchincorrie, Campbeltown
1854 Wilson, Alex., Kirkhill, Old Meldrum	1878 Wilson, Thomas Mackay, Solicitor, Kirriemuir
1857 Wilson, Alex., Crosshill, Campbeltown	1877 Wilson, William, of Banknock, Donny
1864 Wilson, Alexander, Alford House, Dunblane	1873 Wilson, William (Picksley, Sims, & Co.), Leigh, Lancashire
1864 Wilson, Alexander, of Skeoch, Bannockburn	1858 Wilson, William, Dyson House, Waltham Cross, Herts
1864 Wilson, Edward L., Manufacturer, Bannockburn	1879 Wilson, William, Water Meetings, Abington
1859 Wilson, George, Harelaw, Chirnside	1871 Wilson, William, Wolfstar, Tranent
1863 Wilson, George, Manufacturer, Hawick	1878 Wilson, William, Butknowe, Sanquhar
1872 Wilson, George, Greenhill, Selkirk	1881 Wilson, William, Bannockburn House, Bannockburn
1876 Wilson, George, Whiteside, Alford, Aberdeen	1880 Wilson, William Buchanan, Broomlands, Kelso
1880 Wilson, George, junior, Dalveen, Thornhill	1871 Wilson, C. H. II., of Dalnair, Endrick Bank, Drymen
1880 Wilson, George, Druggist, Coldstream	1873 Wilson, Thomas, Solicitor, Aberdeen
1859 Wilson, J., Woodhorn Manor, Morpeth— <i>Free Life Member 1873</i>	1877 Wingate, Andrew, Castlehill, Wishaw
1871 Wilson, James, Boghall, Bishopton	1877 Wishart, D. F., Catherine Street Court, Edinburgh
1844 Wilson, James, Glasgow	1855 Wishart, Edward, 3 Laverockbank Terrace, Leith
1857 Wilson, James, Old Mill, New Cunnock	1868 Wishart, W., Cairntrall, Blackburn, Aberdeen
1858 Wilson, James, Banker, Kilnarnock	1878 Wither, James, Awkirk, Stranraer
1857 Wilson, James, jun., Saddell Street, Campbeltown	1860 Woddrop, William Allan, of Dalharnock, Dolphinton
1860 Wilson, James, Bemersyde West, St Boswells	1874 Wood, Christopher, Kintochat House, Brechin
1866 Wilson, James, 146 George Street, Edinburgh	1873 Wood, Collingwood Lindsay, of Frouland, Bridge of Earn
1877 Wilson, James, Mains of Scotstown, Bridge of Don, Aberdeen	1858 Wood, James, Crown Street, Aberdeen
1870 Wilson, James R., Banker, Sanquhar	1864 Wood, J., Whiteside, Greenlaw, Dunno
1841 Wilson, John, of Cumledge, Dunee	1875 Wood, James, Riddrie, Parkhead
1851 Wilson, John, Wellnige, Dunee	1873 Wood, Walter A., 36 Warship Street, London, E.C.
1855 Wilson, John, Professor of Agriculture, University of Edinburgh	1877 Wool, Major William, Factor, Falkland
1865 Wilson, John, Castle Park, Huntly	1876 Wordsworth, R. W., West Donn, Chichester
1875 Wilson, John, Lecropt, Bridge of Allan	
1876 Wilson, John, of Finnich Malise, 22 Oswald Street, Glasgow	

Admitted		Admitted	
1858	Wotherspoon, Archibald (late Spots- maus, Kelsco), Cust, Canterbury, New Zealand	1873	Young, Geo., Auctioneer, Dollar
1877	Wragg, Charles, Grain Merchant, 4 Stock- well Street, Glasgow	1843	Young, Harry, of Cloish Castle, Kinross
1857	Wright, Bryce, Dowhill, Girvan	1876	Young, Hugh, Killoch, Neilston
1860	Wright, David, Broompark, Largs, Ayr- shire	1856	Young, Jas., Broadholm, Duntocher
1876	Wright, Frank, 61 Cazneau Street, Liver- pool	1860	Young, J. A., Orcharitown, Garliestown
1878	Wright, James, Kirkend, Lochmaben	1863	Young, James, of Kelly, Wemyss Bay
1878	Wright, John, Bengall, Lockerbie	1876	Young, James, yr. of Kelly, Wemyss Bay
1877	Wright, Thomas, Bengall, Lockerbie	1871	Young, James, Waterton, Elgin
1878	Wyatt, Sidney, Nydie Mains, St Andrews	1875	Young, James, Cadboll, Fearn
1870	Wyllie, Alexander, Bolton, Haddington	1868	Young, John, jun. (J. & T. Young), Ayr
1875	Wyllie, Alexander, W.S., 21 Castle Street, Edinburgh	1876	Young, John, Hailes Cottage, Slate- ford
1863	Wyllie, James, Factor, Inveraray	1857	Young, John, Netherwood Bank House, Dumfries
1874	Wyllie, James, Innerwick, Dunbar	1879	Young, John, Cobblebrae, Falkirk
1849	Wyllie, J., late Nowfarn, Mid-Caldor	1863	Young, Matthew, Oilcake Mills, Ber- wick-on-Tweed
1855	Wyllie, W. A., 14 West End Park Street, Glasgow	1869	Young, Robert, Greenlees, Cambuslang
1874	Wyllie, William, Perth	1879	Young, Robert W. (of Colintonwell, Fif- shire), Rock Hall, Dumfries
1878	Wyllie, Wm., Pleasance of Cargen, Dum- fries	1872	Young, Thomas, Ontridge, Linlithgow
1880	Wyse, G. B. M., 11 Northumberland Street, Edinburgh	1876	Young, William Stirling, Keir Mains, Dunblane
1868	Yeats, Alex., Advocate, 89 Union Street, Aberdeen	1873	Young, Wm., Taylorton, Stirling
1838	Yeats, William, of Aquharney, Beacons- hill, Aberdeen	1878	Young, Wm., Shields, Monkton, Ayr
1864	Yool, Thomas, Caldecoats, Elgin	1873	Young, Wm., Waterbank, Carmunnock
1864	Yorston, Capt. M. C., of Tinwald, Irvine House, Langholm	1879	Younger, George, Brewer, Alloa
1852	Young, Alex., Keir Mains, Dunblane	1870	Younger, Henry J. (Abhey Brewery, Edinburgh), 28 Chester Terrace, Regent's Park, London
1867	Young, Andrew, 21 Park Crescent, Stir- ling	1875	Younger, J. B. B. C., Bankhead, Leven, Fife
1859	Young, Andrew, Lochtyside, Thornton, Kirkcaldy	1863	Younger, Robert, 15 Carlton Terrace, Edinburgh
1854	Young, Hon. Lord, 28 Moray Place, Edin- burgh	1863	Younger, Wm., Auchan Castle, Moffat
1877	Young, D. S., Niddry, Winchburgh	1870	Yull, Archibald, Netherside, Strathaven
		1869	Yule, Edward, Balgona, North Ber- wick
		1852	Yule, T. B., 36 Constitution Street, Leith
		1868	Yull, John S., Little Ards, Methlic
		1877	ZETLAND, Right Hon. the Earl of, Aske, Richmond, Yorkshire

TOTAL NUMBER OF MEMBERS, 4812.

#### HONORARY MEMBERS.

#### HONORARY ASSOCIATES.

1874	Dahl, Ferdinand August, Aus, Chris- tiana	1874	Holst, Christian, Norwegian Court Pay- master.
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## DIPLOMA FREE LIFE MEMBERS.

By a Bye-Law passed in 1873, with reference to the Supplementary Charter of 1866, successful Candidates for the Society's Agricultural Diploma are thereby eligible to be elected Free Life Members of the Society. The following have since been elected :—

Admitted	Admitted
1879 Aitken, John M., Crieff	1878 Jukes, R. F., M.R.A.C., Cotnam, Wellington, Salop
1876 Anderson, R. Lang, Milliken Park, Kenfrewshire	1875 Kennedy, William, M.R.A.C., 80 Marine Parade, Brighton
1878 Ashdown, A. H., M.R.A.C., Uppington, Salop	1878 M'Connell, Primrose, Castle Mains, New Cumnock
1875 Beck, Thos. Coker, M.R.A.C., Crowell Rectory, Tetworth, Oxon	1878 M'Cracken, William, Blackhall, Kirkcubright, Newcastle-on-Tyne
1878 Bramwell, John, Marionburgh, Ballindalloch	1876 Masonahy, John Arthur, M.R.A.C., Corrinagh, Torquay
1878 Brown, William, Factor, Earlsmill, Forres	1880 Martin, Wm., Dardarroch, Dumfries
1873 Browne, Colville, M.R.A.C., Park House, Long Melford, Suffolk	1878 Milne, John, Mains of Laithers, Turriff
1873 Brydon, Robert, The Dene, Seaham Harbour	1878 Munby, Edward Charles, M.R.A.C., Myton Grange, Helperby, Yorkshire
1874 Burn, Forbes, Hardacres, Coldstream	1875 Murdoch, George Burn, M.R.A.C., Westerton, Polwarth Terrace, Edinburgh
1873 Campbell, George, Kilkea, Magency, Co. Kildare	1875 Murray, Robert W. E., Wester House Byres, Galashiels
1879 Cannan, James, Urdoch, Castle-Douglas	1878 Nounen, John Edward, 11 Merchiston Park, Edinburgh
1878 Carr, Robert, Felkington, Norham, Berwick-on-Tweed	1878 Norman, Wm., M.R.A.C., Hall Bank, Aspatria
1879 Craig, John, Innergoldie, Comrie	1877 Pudney, R. L., M.R.A.C., Earl's Cone, Halstead, Essex
1880 Craig, Wm., Monktonhill, Monkton	1873 Rome, Thomas, M.R.A.C., Northampton Downs, Barcoo River, Queensland
1873 Eley, Rev. Dr Wm. Henry, Etchingham Rectory, Hawkhurst, Kent	1878 Sharp, John Johnstone, Leaston, Upper Keith
1873 Elliot, Thomas John, M.R.A.C., Bridge House, Southwick, Fareham, Hants	1873 Smith, William B., M.R.A.C., Stoneleigh Villa, Leamington
1874 Erskine, Henry	1876 Sutherland, Alex., Rampyards, Watten, Golspie
1876 Ferguson, Archd. A., Gosfield, Essex	1873 Torry, Adam Ogilvie, Burnside, Forfar
1873 Gerrard, John, Veterinary Infirmary Market Deeping	1873 Wall, G. Y., M.R.A.C., Durham
1873 Giglioli, Italo, M.R.A.C., Florence	1878 Wallace, Robert, Twigloe, Lockerbie
1878 Goddard, H. R., M.R.A.C., Belsay, Newcastle-on-Tyne	1878 Walton, George Kent, Long Campdown, Shipston-on-Stour, Warwickshire
1878 Henderson, John, East Elrington, Haydon Bridge	1873 Wilson, Jacob, M.R.A.C., Woodthorn Manor, Morpeth
1874 Henderson, Richard, The Grange, Kirkcudbright	1879 Wilson, John, Fairfield, Lorton, Cocker-mouth
1873 Hill, Arthur James, M.R.A.C., Accountant, 36 Lansdowne Row, London, W.	
1879 Hunt, Arthur E. Brooke (B.A. Trin. Col. Cam.), Peers Court, Dursley, Gloucestershire	

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